



**The dilemmas of a
scientific tradition:
higher education, science,
and public health at the
Instituto Oswaldo Cruz,
1908-1953**

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Abstract

The article analyzes the tradition in medical and scientific teaching that was established at the Instituto Oswaldo Cruz starting in 1908, introducing an innovative standard in training researchers and public health workers that combined teaching and research activities. Forerunner of the university model, this tradition came up against the question of what social role the institute should play in the new institutional organization of public health and education implemented during the Vargas era: should the Institute serve public health or adopt a university-like format?

Keywords: Instituto Oswaldo Cruz ; teaching; public health; university; Brazil.

At the dawn of the last century, the Oswaldo Cruz Institute (Instituto Oswaldo Cruz, or IOC) – made part of the Oswaldo Cruz Foundation (Fiocruz) in 1970 – broke new ground with the establishment of a tradition of medical and scientific teaching in microbiology and tropical medicine. In institutionalizing this type of teaching, the IOC inaugurated a new standard in Brazil, one that combined the theoretical education of researchers and specialists with practical training. In a way, this foreshadowed the style of teaching that Brazil would try, but fail, to put in place at the universities that were created from the 1930s through 1950s.

While the IOC's short-term goal was initially to train specialists for its research teams, long-term results surpassed this objective, and the institute became a true "school of science and health," preparing Brazil's first generations of researchers and specialists in biomedicine and public health. In the beginning most were physicians, but over time they were joined by chemists, pharmacists, and veterinarians, not just from Brazil but from other Latin American countries, all of them seeking an education previously not to be found in Brazil. Not even the expansion of the number of public and private universities in Brazil under the First Republic, from 1891 to 1915 – the product of initiatives motivated by the positivist or liberal spirit (Cunha, 1980, p.150-159) – diminished the IOC's singular role within the Brazilian higher education system.

This innovative institutional experiment linking teaching and research constitutes what we see as the IOC's 'scientific tradition,' a tradition that – like the São Paulo Biological Institute – stands apart for its emphasis on application, developed outside of a university or other institute of higher education. It was not mere happenstance that the IOC, with this singular pedagogical experience, actually acquired the status of an institute for higher learning, when, under the Statute of Brazilian Universities (Estatuto das Universidades Brasileiras) enacted in 1931 as part of the Francisco Campos Reform, it received a university mandate as part of the University of Rio de Janeiro (Cunha, 1980, p.262).

This article aims to situate the IOC tradition within the context of the institutional arrangements and administrative changes that governed the reorganization of Brazilian university teaching after 1930. New public policies were then enforced in education and health, above all when Gustavo Capanema was head of the Ministry of Education and Public Health, and this fed expectations within intellectual and scientific circles about the institutionalization of scientific research and its professionalization in Brazil. The upshot was a public discussion about the IOC's social role, a debate that continued through 1953, the year the Ministry of Education and Culture was created and an institutional and administrative separation was implanted between education and health within the realm of the federal government.

In formal terms, with the structuring of the State's bureaucratic apparatus in response to the political and institutional changes of the Revolution of 1930, the IOC's administrative ties had to be defined. In substantive terms, the question – indeed the dilemma – was to discover how the IOC's medical and scientific teaching tradition could at one and the same time serve the academic and scientific goals of a university and the pragmatic designs of public health initiatives. Health or university? Reflecting the dichotomy between pure and applied science that was then part of scientists' discursive repertoire, this doubt found

expression at four distinct moments, in the course of episodes that while not exactly identical did have the same intent: to free the institution from its original bond to public health and incorporate it into the university realm. While all such attempts failed, it is worth asking what motivated them and what impact they had on the institute. Our argument first focuses on the features of the courses offered at the IOC from 1908 to 1931. Next we explore the context of the Capanema reform, under which the IOC's public health course was structured. We then examine the four moments, from 1934 to 1953, when the matter of its institutional reconfiguration came up for consideration. During this process we observe the influence wielded by scientist Carlos Chagas Filho, member of the IOC's research staff until 1937, and also by the Biophysics Institute, that he mounted at the University of Brazil. This influence was explicit in Chagas Filho's initiatives to transform the IOC into a university institute, a goal that even led him to architect its temporary integration with the University of Brazil in 1946. He also exerted an indirect influence, introducing to the Biophysics Institute's organizational model the university standard of research coupled with teaching, in counterpoint to the tradition at the Oswaldo Cruz Institute.

From veterinary school to medical specialization

From its very start, the IOC maintained an informal system for training its personnel, because – with the exception of Oswaldo Cruz and Henrique Rocha Lima, who had specialized abroad – its initial team had been educated at Brazilian medical schools and had little experience in microbiology. Under its 1907 by-laws, which discarded the original name of Federal Serum Therapy Institute, replacing it with Manguinhos Institute of Experimental Pathology, one of its duties would be to establish a “veterinary school” that would include “pathology, hygiene, and treatment” as part of “scientific work” on “the study of infectious and parasitic illnesses of man, animals, and plants” and “matters related to hygiene and zoology” (Brasil, 1907).¹ The next year, when the body was again renamed – his time christened the Oswaldo Cruz Institute (Brasil, 1908) – it was stipulated that “veterinary courses at the institute involve only bacteriology and parasitology applied to pathology, hygiene, and veterinary treatment.” It was likewise determined that these courses, open solely to physicians or veterinarians, would be tuition-free (although material used in practical classes would have to be paid for) and that candidates should apply to the director himself, who would then request government approval.

This was the regulatory framework for teaching activities at the institute. Several courses were in fact taught there, later encompassed under the umbrella term “curso de aplicação” – for the purposes of this article translated as “specialized training course.”

The 1919 by-laws, under which the institute was reorganized (Brasil, 1919), mentions that specialized training courses should be held annually on “medical zoology, divided in two parts: one on microbiology and one on medical zoology.” One decade later, new guidelines were set out, calling for an annual specialized training course in immunology, bacteriology, viruses, mycology, medical zoology, and other branches of biology” studied at the institute.² The course was then opened to pharmacists and naturalists too, in addition to physicians and veterinarians. Basically defined as practical in nature, the course was

still free. Graduates were eligible to enroll in the special hygiene and public health course through the Rio de Janeiro Medical School (Faculdade de Medicina do Rio de Janeiro) without taking the entrance exam. The class valedictorian received an Oswaldo Cruz Prize medal, instituted in honor of the IOC's founder, who died in 1917. The director was granted authority to arrange for other courses on any other specialty practiced at the institute and to pay technical personnel appointed to instruct the classes. The director likewise set the salary (known as *pro labore*) and paid it out of institution earnings.

As the initial scope of the course gradually expanded and both specializations and clientele diversified, more and more professionals and students were attracted from the federal capital and other states and from other Latin American countries as well. From 1908 to 1935, 500 candidates enrolled in the course; from 1911 to 1949, 275 of them passed (Relação dos alunos que se inscreveram..., s.d.; Relação dos alunos aprovados..., s.d.).

Contributing to this was the often mentioned incentive that one of the course's purposes was to provide an introduction to scientific research so that its graduates could then join the institute in some capacity. In 1919, it was stipulated that preference be given to IOC 'disciples' in replacing staff assistants. It was later decided that the top students could continue their studies by doing unpaid internships at the institute's laboratories or could begin a research program under the advisorship of a staff researcher. By 1949, it was said that the specialized training course trained not only future IOC technicians but also personnel for similar organizations.

Although the number of openings available each year was limited to twenty or thirty, the specialized training course became a recruitment tool for new researchers. The institutionalization of a course that conjoined specialization-level training with research activity was an organizational novelty and forerunner of a format that the research community began setting their sights on in the 1930s but which would only become a reality much later, within the walls of the university, primarily when graduate courses were established in Brazil in the 1960s. Furthermore, the course made a decisive contribution within Brazil and Latin America to the dissemination of microbiology and tropical medicine, fields that had been undergoing consolidation on the world stage since the closing decades of the nineteenth century.

Although no studies have been done on the course, we can obtain an estimated measure of its impact from the high number of graduates who went on to work at research institutions, institutes of higher education (schools of medicine, veterinary medicine, agriculture, pharmacy, and hygiene), and public health services, including the Army and Navy, during the early decades of the twentieth century.³ Furthermore, though they had graduated from medical schools, almost all the biologists born at the turn of that century spent time studying at Manguinhos, either doing internships at its laboratories or taking the specialized training course (Schwartzman, 2001, p.217).

Ascending into higher education: specialization in public health

The 1925 educational reform (Brasil, 1925), promoted by the Ministry of Justice and the Interior, provided an experience parallel to the specialized training course. Under the

reform, a special course on hygiene and public health and a chair in tropical medicine were established at the Rio de Janeiro Medical School. At the time, Carlos Chagas was director of both the IOC and the National Public Health Department (Departamento Nacional de Saúde Pública, or DNSP); in May 1925, he was appointed to the new chair under a presidential decree that instituted the criterion of “notório saber” (noteworthy knowledge) and thus exempted Chagas from taking the usual qualifying exam. These new courses, which involved instruction and research on the biological, epidemiological, and symptomatic aspects of diseases of a collective nature, were meant to prepare medical students for work in the field of preventive hygiene. Another aim was professional in nature: training specialists was considered essential to the functioning of health services and the DNSP, whose posts were held mainly by medical school graduates.

The IOC occupied a central role in the DNSP’s organization. The IOC director was assigned responsibility for program content and for the appointment of instructors both at his own institute and at the department. Candidates to the Medical School’s 12-month special course on hygiene and public health, which was defined as a specialization course in medical teaching, had to be medical school graduates who had completed the specialized training course or, alternatively, had passed an entrance exam on the subjects taught at the IOC course. The faculty comprised technical personnel from the IOC⁴, who taught theoretical classes in the biomedical field (bacteriology, immunology, chemistry, helminthology, protozoology, entomology, and pathology) and in the sanitary sciences, then known as ‘hygiene’ (vital statistics; pre-natal, child, and school hygiene; industrial hygiene; urban and rural sanitation; epidemiology; and sanitary administration). Practical classes focused principally on tropical diseases but explored other illnesses as well, like tuberculosis, leprosy, and venereal diseases. Although the IOC director was responsible for appointing the examining committee, he shared with the director of the Medical School responsibility for final approval of students and for issuing the diploma of hygienist, which qualified the graduate for appointment to a federal post as a public health physician, with no need to take a qualifying exam. These candidates would be given preference over all others (Labra, 1985, p.364-365; Benchimol, 2001, p.71; Lima, Fonseca, 2004, p.27-28; Castro Santos, Faria, 2006, p.298-301).⁵

Although the proposal to link a research institute and an institute of higher learning – an unusual arrangement at that time – had been devised jointly by Carlos Chagas and the director of the Medical School, Juvenil da Rocha Vaz⁶, it was the target of harsh criticism from Congress and the medical community. Government opponents in the Lower House complained that approval of the educational reform had been a symbolic act, since the decree enacting it had been ratified by the president of the republic before it was even sent to Congress; thus, they felt the decree constituted an affront to legislative power. They also criticized the minister and the director of the Medical School for displaying personalism and political patronage in appointing Carlos Chagas chair of tropical medicine, questioning in fact the very legality of the act, as Chagas was not a professor at any Brazilian university (Labra, 1985, p.296).

In turn, the teaching staff at the Medical School voiced its unhappiness about their institution’s subordinate position to the IOC and the fact that the IOC director was

allowed to intervene in a sphere where school faculty had authority. They also felt that the educational reform had confused the purposes of both institutions, with the IOC erroneously assigned a teaching role in the training of medical professionals, thereby usurping the Medical School's rights. Decrying their loss of autonomy in granting diplomas, the faculty appealed to the government to void the reform. Students joined the protests, worsening the crisis; with the support of colleagues from Law School (Faculdade de Direito) and Polytechnic School, they marched in protest against several aspects of the reform, including the requirement to take the course on tropical diseases; a strike was eventually called and several arrests made (Labra, 1985, p.295, 299-301, 305).

Stretching from 1925 through 1926, these protests reignited old rivalries⁷ but failed to block implementation of the reform, which allowed the IOC to extend its educational reach towards higher education. Carlos Chagas's position of power and prestige before the government certainly helped make this possible. Yet it can be seen that the project had broader designs, of political relevance not only to the government – who sought to expand federal power in the realm of public health, to the detriment of state power (Hochman, 1998) – but also to those doctors working in public health who wanted sanitary practices and sciences to achieve formal, specialized, and professional status (Labra, 1985, p.361). These aspirations were grounded in the worldwide trend towards the professionalization of public health, stimulated by such international bodies as the League of Nations (where Carlos Chagas represented Brazil), the Pan American Sanitary Bureau (now the Pan American Health Organization), and the Rockefeller Foundation. In the United States, the Rockefeller Foundation supported the 1916 creation of the first specialized public health school – the Johns Hopkins University School of Hygiene and Public Health – which became a model in teaching and professionalization and also the preferred training center for a number of Brazilian public health specialists (Lima, Fonseca, 2004, p.26-27; Castro Santos, Faria, 2006, p.292).

While these controversies raged on, the tradition of combining research and teaching in the effort to solve public health problems took firm root at the IOC. These educational experiences, including the specialized training course, prompted the institute to engage in the debate on higher education reform the following decade, as we will see later.

This process began with official recognition of the IOC's teaching role. The University of Rio de Janeiro, created in 1920 by merging the schools of engineering, medicine, and law, was reorganized in 1931. On this occasion, it was decided that the IOC, along with other technical and scientific institutions in the federal capital,⁸ could contribute to the expansion of teaching at the University by offering advanced and specialization courses, and thus the institute was granted a university mandate. The Statute of Brazilian Universities (Estatuto das Universidades Brasileiras) (Brasil, 1931a) corroborated these guidelines, stating that higher education – which should take the form of a university system – could be administrated by separate, independent institutions, governed by their own regulations.

If the reorganization of the University, led by Education and Public Health Minister Francisco Campos, widened the scope of higher education by recognizing independent institutions and bringing them into the system while respecting their administrative autonomy, in contrast the Statute of Brazilian Universities granted authority over the

operating rules of any university established in Brazil to the Minister and to the National Board of Education (Conselho Nacional de Educação). Lending form to the concept of a centralized university system, this represented a menace to the survival of the kind of teaching practiced at the IOC.

The centralizing nature of the reform was in keeping with a project engineered by political groups that had formed the Liberal Alliance front in 1930 and ignited an armed rebellion intent on removing the São Paulo coffee-growing bourgeoisie from power. Historiography sees the Revolution of 1930 as signaling the collapse of the oligarchic State (Fausto, 2008, p.142) and the institutionalization of a new type of State, aligned ideologically with authoritarian, nationalist thought and organically committed to political and bureaucratic centralization.

Characterized by a diversity of political forces and the lack of any hegemony within the Liberal Alliance, the very process that seated Getúlio Vargas as president bore the imprint of this centralizing tendency. The political pact born of these circumstances – which has been labeled : a “State of compromise” (Fausto, 2008, p.25) – buttressed the new regime and allowed the federal government to strengthen its power at the national level, thus forging a new kind of relation between State and society which was to frame the historical process of transition from an agrarian export society to an urban, industrial Brazil.

The political and institutional changes introduced during the course of the 1930s altered relations between ruling groups and the State, with state-level executive powers subordinated to central government control through a complex interweaving of federal “interventors” (federally appointed governors), local elites, and federal government representatives. Strategic decisions about economic and social development were shifted to the federal executive, who took the helm in implementing the national project, backed by the administrative reform (Diniz, 1999, p.26) first launched during Vargas’s constitutional administration (1934-1937) and then further extended following the 1937 coup d’état. This political and institutional framework was complemented by the establishment of state corporatism, which meant entrepreneurs and urban workers gained State protection, in turn spawning interest organizations that were regulated and controlled by the government (Santos, 1979).

These transformations did not pass the IOC by. Analysts have noted that the immediate, most readily visible effects at the institute were the loss of funding resources and of administrative autonomy (Stepan, 1976; Benchimol, 1990; Schwartzman, 2001). Yet there were even more profound consequences, impacting the institute’s very identity and social role, since the question of cutting the institute’s traditional ties with public health and transferring it to the arena of education – more precisely, to the university – was put on the table.

The matter was raised in the midst of debates about reorganizing higher education into a centralized system. The establishment of this brand of university was one of the key goals of the Ministry of Education and Public Health reform, led by Minister Gustavo Capanema, who took office in July 1934 when Vargas was constitutionally sworn in. In November of the same year, Carlos Chagas died. This misfortune inarguably removed a

major roadblock to the plan, clearing its path from that point on. From then until 1953, when the Ministry of Health was created, the identity and social role of the IOC came up for discussion time and again, sparked by a series of events that unfolded over time, as described in the following pages.

Tradition up for discussion

Capanema Times

Known as the Capanema reform, the reform of the Ministry of Education and Public Health was put to the floor of Congress in late 1935 and approved under Law 378 on January 13, 1937. It was an integral part of the institutional changes put in motion by the Vargas administration and the backdrop for public policies in health and education. Grouping these two sectors into a single ministry was an institutional innovation that evinced the prevailing understanding of their interdependence: it was believed that the search for solutions to educational problems would involve similar solutions in the realm of public health. This view was grounded in the notion of hygiene that had held sway since the nineteenth century, according to which a healthy life depended upon normative and behavioral strategies in prevention at the level of the individual, which would be achieved through an educational process. Health education initiatives would thus tend to regulate daily life, invading people's homes, workplaces, and leisure time (Fonseca, 2003, p.466).

This line of thought was fully consonant with the ideologies underlying the ambitious project to build a new nation-state, particularly after the Vargas dictatorship took power in 1937. The new State would be sustained by its promotion of social justice (understood as the ideal of achieving social ascent through work), recognition of worker rights, protection of the family, and education, envisioned as a civilizing policy that would shape a fully realized people (Gomes, 2003, p.445).

The actualization of these principles and their influence over the new ministry's policies had their heyday under Minister Gustavo Capanema (1934-1945). This politician from Minas Gerais assumed the ministry following the tumultuous period of the Provisional Government (1930-1934), during which the ministry had changed hands time after time and its organizational structure had undergone countless changes, not only hampering development of the new body but at times even bringing things to a grinding halt (Hochman, Fonseca, 1999, p.82).

It was under Capanema that the Ministry of Education and Public Health was crafted into an institution coherent with the Vargas administration's centralizing, rationalist guidelines. The Capanema reform, which reorganized administrative structures and launched sweeping initiatives in education, public health, social assistance, and culture, was a milestone in the period's statist policies (Schwartzman, Bomeny, Costa, 2000).

This dimension was underscored by the minister himself when he declared that the word 'culture' synthesized his ministry's program. True to an overarching mission of embracing Brazilian culture, Capanema actually proposed renaming his bureau the Ministry of National Culture on two occasions (1935 and 1937). In the end, it received the title Ministry of Education and Health (Williams, 2000, p.251).

Structuring the educational system at all levels of teaching entailed a vast set of proposals and changes. Outstanding among these was the organization of secondary education, which in addition to providing occupational training now became a mandatory step towards higher education, previously not the case. Just as noteworthy was the reform of higher education, represented by the creation of the University of Brazil, established under Law 452 and sanctioned by Getúlio Vargas on July 5, 1937. This is considered Capanema's most ambitious project, and he planned to build a grandiose university campus to house the institution. The foremost purpose of the university – defined as a model of higher education that would recruit students from across the country – was to educate the ruling elites, whose basic education rested on cultivating and learning humanistic culture.

The approach advocated by the minister did not foster an environment propitious to experimental research at the new university, as it was a secondary, subordinate goal. Although the National School of Philosophy (Faculdade Nacional de Filosofia, or FNFfi), created in 1939, offered science courses⁹, training was restricted to specialists and teachers, primarily for secondary schools, with a view to meeting the State bureaucracy's need for technical personnel in education and culture (Mendonça, 2002, p.155-157).

In the public health sphere, the main concern was structuring the National Health Department (Departamento Nacional de Saúde, or DNS), guided by the same centralizing premises applied to education. The reins of the DNS, which replaced the National Directorate of Health and Medical-Social Assistance (Diretoria Nacional de Saúde e Assistência Médico-Social, or DNSAMS), were handed to João de Barros Barreto.¹⁰ The innovative measures put in place by this public health practitioner included the establishment of a nationwide network of federal health offices (*delegacias*) across eight regions of Brazil. It was their job to oversee the activities through which the federal government collaborated with local medical and social assistance services and also to inspect federal services. In this way the federal government could ensure its presence at a state level – a novelty, because prior federal initiatives had been almost wholly restricted to the capital. At a second point in time, in 1941, another organizational innovation was instituted: the creation of national health services. Coordinated with the federal *delegacias*, these services were dedicated to controlling, preventing, and combating contagious diseases. The federal government thus stepped up its presence in the far corners of Brazil, “combining political centralization with administrative decentralization” (Hochman, Fonseca, 1999, p.85).

Centralization and nationalization – these were the marks the Capanema reform left on Brazil's organizational apparatus in education and public health. In the latter case, these principles were manifested in the standardization of norms and services and in an ambitious project to extend government action nationwide; in the former case, they found full expression in the authoritarian, hierarchical conception underlying changes to the educational system. In education, the drive to regulate and structure the bureaucratic machine served the purposes of centralization, coordination, oversight, and direction of educational activities throughout Brazil (Schwartzman, Bomeny, Costa, 2000, p.243-244).

Little or nothing was left unscathed by these and other broad and profound changes promoted by the Vargas government. Although the IOC did not go under, it did not

escape the maelstrom, out of which arose the idea of shifting public health over to education within the cabinet structure.

Public health or higher education?

Round one

This question presented itself when the bill to reform the Ministry of Education and Public Health came before Congress and Capanema proposed that a specific body named the National Public Health Institute (Instituto Nacional de Saúde Pública, or INSP) be created to deal with sanitary administration and take over the public health duties entrusted to the IOC until then. Its purpose would be to “conduct completely thorough and rigorous studies on all sanitary problems in Brazil, in systematic, ongoing fashion” (Brasil, 1935) in the fields of etiopathology, epidemiology, and prophylaxis of the country’s endemic diseases; it would also offer specialization courses at its laboratories for medical doctors and personnel from state and municipal public health services (Brasil, 1935). Meanwhile, the IOC would become an institute for higher education within the University of Brazil, like the National Observatory, National Library, and National Museum. These moves would strengthen both the institute’s scientific work – which consisted basically of research in experimental medicine and other branches of biology – as well as its teaching activities.

The proposal was in tune with the guidelines of the Third Pan American Conference of National Directors of Health, held in April 1936 in Washington D.C., whose recommendations included the creation of specialized technical services to study public health issues in Latin America. The Brazilian representative at the event, João de Barros Barreto, was head of the DNSAMS, and together with other staff from the same department helped draw up the proposal to create the INSP.

When the minister asked Barreto for his opinion about modifications to the original project presented by the Lower House’s Public Health Committee, he voiced a number of criticisms, above all about the large number of sections forecast and the dearth of DNSAMS specialists to fill posts at these services. For Barreto and his technical group, the INSP should incorporate the special course on hygiene and public health given at the Medical School, then constrained by the prerequisite that prospective students be graduates of medical school, something that failed to respond to the needs of Brazil’s expanding health services. They believed these services demanded professionals with other profiles – like sanitary engineers, biostatisticians, public health laboratory technicians, sanitary guards – who should be required to have specialized training (Castro Santos, Faria, 2006, p.304).

Although this discussion spoke to the fate of the IOC, the institute was not called on to opine. While the skirmish was unfolding in the Lower House, IOC director Antônio Cardoso Fontes was working on a plan to remodel the institute which included the incorporation of new specialties and facility upgrades. In 1937, he left it clear that he knew nothing of the proposed changes, expressing his surprise to the minister:

These lines had already been written when this Directorate learned, through publication in the *Diário Oficial* of January 13, 1937, of the reform to the Ministry of Education and

Public Health. This reform contains measures that benefit the Oswaldo Cruz Institute, granting it funds to proceed with its remodeling and maintain staff now on the payroll. Alongside these [measures] are others that will have a profound impact on the life of the institute, and it is impossible at present to predict all possible effects, given the position in which the institute has been situated in the administrative hierarchy (Fontes, 1937, p.XXI).

The director was more than justified in lodging his complaint. After all, the future of the institute was being decided without his input. The drafter of the INSP proposal was in fact Barreto, who had defended the idea ever since February 1937 when he took his post as director of the DNS, which had replaced the DNSAMS. Aware of the consequences that might ensue, Barreto wrote to ask for the minister's support, stressing that the INSP did not 'conflict' with any existing institutes, in a clear allusion to the IOC:

Until such time as you decide to proceed with work on the new buildings that will constitute the INSP, I believe it would be feasible to begin operations at premises belonging to the Ministry, assigning technicians from health services and contractors to conduct [this work]. ... Studies could thus be undertaken on bacillary dysentery, ancylostomiasis, endemic goiter, the types of household septic systems most appropriate to our country, and valuable investigations on the physiology of labor. ... I hope that in your sagacity, you will grant what is among the most just and persistent aims in Brazilian public health, which will allow you to move forward with your valuable achievements, culminating in the establishment of the INSP, whose lofty purposes in no way conflict with those of other, existing institutes in Rio de Janeiro maintained by the federal government. To demonstrate this, one need only cite the new institute's divisions: Preventive Medicine, Sanitary Engineering, Hygiene, Sanitary Administration, Biostatistics – all strictly within the public health sphere (Barreto, 1 jun. , 1937).

The doggedness of the DNS director notwithstanding, the INSP never came into being. The proposal was shelved in late 1937, a few days before the Estado Novo was established. Although we do not know precisely what led to this outcome, the duties of the INSP were incorporated by the IOC, which, under the Capanema reform, was defined as one of the services among DNS executing agencies, whose "primary purpose" was to "foster scientific investigations related to the problem of human health" and to meet "the constant needs of applied science" (Brasil, 1937a). With the INSP project frustrated, the IOC recouped its vital position within public health and gained a strategic spot in Barreto's plans.

Under the DNS reform, in 1940, the Medical School's special course on hygiene and public health – eliminated in 1938 due to low enrollment (Labra, 1985, p.372) – was affiliated to the IOC and retitled "public health course" (Brasil, 1940a). The modifications made on this occasion included a clause exempting any graduate of the specialized training course from repeating classes already taken; further, he or she would be required to present a medical diploma and submit an application to the IOC director, who ruled on the candidate's acceptance. An entrance exam would be held if the number of applicants exceeded the number of available spots. The teaching staff was to comprise IOC technicians and personnel from the Ministry of Education and Health. Appointed by the minister and approved by the president of the republic, these instructors would receive an honorarium for each class taught. The program also provided for the participation of Brazilian and foreign technicians of recognized expertise, at the discretion of the IOC

director. The new by-laws further stipulated that the program would encompass disciplines other than those offered by the Medical School course and would extend for eighteen months, divided into five terms.¹¹

The IOC's mission was not circumscribed to administering this course. Barreto relied on the institute's technical staff to give classes at a series of advanced and specialization courses geared for nurses, *visitadoras* (women community public health workers, engineers, and sanitary guards that the DNS had established to train its own staff as well as heads and personnel from state-level health services (Lima, Fonseca, 2004, p.33-34; Brasil, 1942). One draw of this type of course was that the final certificate, furnished by the IOC, made the graduate eligible for a position as a non-regular staff member (*extranumerário*), performing precisely the job for which the course had trained him or her. Although the department's program offered some classes similar to those at the IOC's, Table 1 shows that the DNS classes focused on specific topics in the field of tropical diseases, suggesting it bore a resemblance to the practical portion of the discipline taught at the Medical School.

Table 1: National Health Department courses (1942-1951)

COURSE/YEAR	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	Total
Laboratory techniques	9	5	10	18		4	8	14	13	5	86
Sanitary engineering		6	3	5							14
Vital statistics		7									7
Mental hygiene and psychiatry		18	11	13	15	16			18	19	110
Hospital administrative organization		25	18	16	22	30	38	37	34	24	244
Public health administrative organization			11	8	6	8	10	7	19	8	77
Nutrition				17	9	21	13			11	71
Venereal diseases			16	12	15	13	14	21	15	15	121
Venereal diseases (Porto Alegre)						13					13
Malaria	14	17	14	7	8	6	8	9	5		88
Leprosy	15	8	11	13	5	12	7	7	15	12	105
Tuberculosis	11	15	19	28	43						116
Bubonic plague	27										27
Trachoma			13	15	12	6	8	17	14	9	94
Leprosy (São Paulo)							12	4		20	36
Leprosy (Belém)							12				12
Leprosy (Vitória)							8				8
Leprosy (Recife)								12			12
Leprosy (Curitiba)									7		7
Leprosy (Fortaleza)									10		10
Leprosy (Goiás)									13		13
Leprosy (Porto Alegre)										27	27
Total											1298

Source: Registro de alunos que obtiveram diplomas..., s.d.

The information in Table 1 illustrates how important personnel training was to the project of nationalizing and centralizing health initiatives. In parallel with major regulatory actions intended to direct the operation of health services, the goal was to solidify a broad institutional framework at the federal and state levels, requiring not only the construction of health centers, posts, hospitals, and dispensaries but heavy investments in specialized technical training in public health – distinct from medical training – so personnel would be available to fill key posts in the administrative structure. A comparison of earlier results with those recorded from then on gives us a measure of the efforts put forth in this period: only 78 public health doctors graduated from the Medical School course during its twelve years of operation (Labra, 1985, p.372; Castro Santos, Faria, 2006, p.305-306), whereas, from 1940 to 1951, 226 graduated from the IOC's public health course (Registro de alunos que obtiveram diplomas..., n.d.) and 1,298 from the DNS's.

The topic of human resource training in health never again left the political and professional agenda of Brazil's public health specialists, inspired by the U.S. teaching model. The push to institutionalize public health as a specialization picked up pace the following decade and culminated with the 1954 foundation of the National Public Health School (Escola Nacional de Saúde Pública) (Fonseca, 2004). Until that date, the IOC continued to train specialists in the area. If Barreto's failed attempt to create the INSP engendered this opportunity and kept the IOC from relinquishing its traditional responsibilities in health, uncertainty about its social role continued to haunt the institution.

Round two

Another movement was in progress around the same time. Its roots lie in two unforeseen and concomitant events: the death of Evandro Chagas, in 1940, and the replacement of IOC director Antônio Cardoso Fontes for health reasons in 1942.

In 1937, Evandro Chagas, son of Carlos Chagas, had established the Service for Studies on Major Endemic Diseases (Serviço de Estudos das Grandes Endemias, or Sege) at the Oswaldo Cruz Hospital, devoted to a research program on infections and tropical diseases endemic to Brazil, like leishmaniasis, American sleeping sickness (trypanosomiasis), schistosomiasis, and others. Associated with the program were advanced and specialization courses to train staff for Sege itself, for sanitary services, and for research institutes or posts that Sege hoped to found in a number of other states in Brazil. Enjoying the support of Barreto and the minister himself, Sege conformed to health policy guidelines by carrying out research and training, in addition to working to forge direct ties with federal and state sanitary services in order to better orient campaigns against endemic diseases (Kropf, 2009).

Evandro Chagas's death in a plane crash on December 18, 1940, brought a successful career to an abrupt end. In his absence, his younger brother, Carlos Chagas Filho, returned to the institute, which he had left in 1937 after accepting the chair in biological physics at the Medical School, where he set up the laboratory that formed the foundation of the Biophysics Institute, created in 1945 at the University of Brazil.¹²

In oral testimony, Chagas Filho said his appointment to replace his brother came at the request of Getúlio Vargas himself, for Brazil's president was afraid the Service might end up being closed because of its administrative and financial autonomy vis-à-vis the

IOC (Kropf, 2009, p.293-298). During his time at Sege (1941-1942), Chagas Filho worked to formalize ties with the IOC, proposing that it be transformed into the Division of Studies on Endemic Diseases (Divisão de Estudos de Endemias), with IOC researchers absorbed into Sege's staff; he also managed to guarantee federal funding through the director of the Administrative Department for Public Service (Departamento Administrativo do Serviço Público, or Dasp), Luis Simões Lopes, a friend of his (Chagas Filho, 1991).

But Chagas Filho did not limit himself to Sege. According to the same oral testimony, he reported that he apprised Minister Capanema of his concern about the lack of clarity regarding the IOC's role, to which the minister supposedly replied by asking him to submit a project to restructure the institute. Readily taking up the task, Chagas Filho drafted a document in the form of by-laws, in which he underlined the need for modifications so the institution would mirror the era's new directions in international biological research, as the field was experiencing a "radical revolution":

It is therefore evident that the transformation of biological science is not delineated solely by the introduction of new techniques but also entails a change in theoretical concepts and the exegesis of biological phenomena, such that it demands the application of new methods of study: biophysical and biochemical. ... In consideration of what has been stated herein, the IOC should be reorganized so as to render it comparable to its sister institutes around the world, with its laboratories grouped into divisions headed by a chief, all under the guidance of the institute director (Chagas Filho, 14 jan. 1941).

Along with other features of the new organizational model (such as scientific autonomy for the director, full-time commitment by staff, and higher salaries), Chagas Filho called for the "transfer of some services to more appropriate agencies so the institute [could] confine itself to scientific research and restrict its activities" (Chagas Filho, 14 jan. 1941). It should be pointed out that the proposed model adapted precepts that had underpinned the INSP project, with activities divided between scientific research (then known as 'basic' or 'pure') and public health. During the drafting of the model, IOC director Antônio Cardoso Fontes stepped down due to health problems, occasioning a dispute over his successor.

Minister Capanema then invited Chagas Filho to take over as director of the Manguinhos Institute. His acceptance of the invitation unleashed a battle that transcended the walls of the institution and reached into the DNS, which had just completed a broad administrative reform¹³ that made the IOC part of the new federal sanitary structure, comprised of national services. From this perspective, Chagas Filho's proposed changes were inopportune, since without the INSP, Manguinhos and Sege were cornerstones of health policy.

Bitter about the minister's invitation to Chagas Filho, Barreto reacted by adroitly indicating Henrique Aragão as candidate; it would be hard to refute his internationally recognized academic stature or his institutional credentials, since he was a member of the first generation of researchers recruited by Oswaldo Cruz.

The health minister and the director of the DNS then locked horns over who would be the next head of the IOC. Although Aragão, who was made interim head in January 1942, was likewise an advocate of the institute's scientific autonomy and believed that

research could not be restricted to “the study of problems as defined by DNS heads,” he favored maintaining its ties with public health, in agreement with Barreto. Accordingly, he suggested that the institute rearrange its research areas, dividing them into research focused primarily on helping to solve issues faced by the DNS (sanitation, nosology, hygiene) and basic research in fields like biochemistry and physiology, with the caveat that the latter also support the former (Aragão, 4 fev. 1941).

Much as Carlos Chagas Filho had considerable backing, Aragão apparently was armed with more astute arguments and in the end won out. He was appointed director in July 1942.

Round three

Defeated, Chagas Filho returned to his biophysics laboratory. But he was back on stage three years later, once again defending the idea of tailoring the institute to the university model which the scientific community then believed conducive to the development of pure, basic science, to use the language of the day (Paim, 1982, p.52-54). Viewed from this angle, scientific research and public health should be separate.

The question of the IOC’s identity and social role came back to the table as soon as the Vargas dictatorship met its demise. Under the short-lived Provisional Government of José Linhares, the new Minister of Education and Health, Raul Leitão da Cunha – who had been friends with Chagas Filho since his time as ministerial assistant at the Medical School in the 1930s – asked to hear the scientist’s suggestions about the University of Brazil. According to Chagas Filho himself, he told the minister that professors should keep a full-time work schedule and that teaching and research institutes should be organized into basic fields like physics, chemistry, and mathematics, with professors responsible for teaching these disciplines at all university courses. He also commented on matters of a broader nature, like the incorporation of the National Museum and the IOC. The minister was in agreement so long as Chagas Filho presented him a petition signed by the majority of the institute’s researchers (Chagas Filho, 2010, p.22).

Still according to his account, Chagas Filho managed to obtain the needed signatures at Manguinhos, thus sealing the IOC’s (and the National Museum’s) incorporation into the University of Brazil as a “supplementary institute,” in the terms of decree 20.445 of January 22, 1946 (Brasil, 1946), which approved the university’s by-laws. However, Chagas Filho explained, a reversal of opinions occurred and the same researchers who had signed the petition reneged on their decision.

In a document submitted to Rector Ignacio de Azevedo Amaral, these researchers called for “the re-establishment of autonomy” for the Manguinhos Institute, asserting that their technical and scientific independence would be threatened by inclusion within the university organization. The statutory definition of “supplementary institution” placed the institute in a marginalized, subordinated position within the university’s organizational structure, they argued, given that the institute would be blocked from taking part in the University Council and would have only one representative on the University Assembly, whereas every university professor would have a vote in the assembly as well. In light of this blatant inequality, the researchers asked that the IOC be withdrawn from the University

of Brazil and once again made dependent solely on the Ministry of Education and Health and, by extension, on the Presidency of the Republic (Memorial dirigido..., 7 fev. 1946). Signed by 49 researchers, the request was granted and the institute's organizational status quo regained.

For Chagas Filho, this episode was not limited to his frustrated effort to make the IOC part of the University. His conversation with the minister led to the realization of a cherished dream of his: authorization to transform the laboratory belonging to the chair of biological physics at the Medical School into an autonomous institute within the University, with all the rights requested by institute scientists but not conceded to the IOC. Thus was born the Biophysics Institute (Chagas Filho, 2000, p.91-92). Less than a decade later, the IOC, on the other hand, would find itself wrestling with the same dilemma concerning its social role.

Round four

Following a phase of prosperity¹⁴ the IOC went through a period of turmoil in the late 1940s, kicked off by the surprising attitude of its director, who stepped down in early 1949. Aragão's decision was motivated by his disagreement over the transfer of the Yellow Fever Laboratory – established in 1937 under an agreement with the Rockefeller Foundation – to the National Yellow Fever Service, as proposed by the DNS.

This was the first in a series of crises that was to instill an atmosphere of political instability at the institute for the next two decades. The appointment of Olympio da Fonseca Filho to succeed Aragão stirred disapproval right from the outset. In his oral testimony, Fonseca Filho recognized that there was a palpable climate of animosity when he informed his colleagues of his decision to accept the invitation extended by Education and Health Minister Clemente Mariani:

Since there have always been fights at the Institute, I called Júlio Muniz, who invited Arêa-Leão over to my home. I saw right away that there was opposition, because Arêa-Leão was in a mood. Souza Araújo telephoned soon after that, as if taking me to task. "Is it true you were invited to be director of the institute?" When I replied yes, he didn't carry on the conversation but rang off coolly. That's when I realized what opposition I'd be up against. The next day, or two days later, before I'd even taken office, the newspaper was already bashing me (Fonseca Filho, 2010, p.41).

The internal reaction to Fonseca Filho's appointment has been blamed on his own behavior towards the institute, particularly his choosing the Medical School over Manguinhos in 1937, when a law was enacted prohibiting public employees from holding more than one public post. Other reasons for discontent surfaced during his term of office, which was the focus of controversies that went beyond the institution itself. The storm began in October 1951 when Fonseca Filho announced that the institute had depleted its stock of flu vaccine, contending that the government had failed to guarantee funding for production. The press gave this news ample coverage, armed with inside information from institute staff who accused the director of bad management, using research funds for other ends, de-structuring laboratories, and other misdeeds (Ferreira et al., 2002, p.21; Benchimol, 2001, p.96-99).

The crisis worsened in June 1952, when 41 scientists signed a letter to the president of the republic threatening to resign unless something was done about the irregularities committed by the director, foremost among these the hiring of two hundred staff members without a proper selection process and at salaries higher than those earned by researchers and technicians charged with the same duties (Ministério da Educação e Saúde, 27 maio 1952). The papers continued to print accusations and rebuttals through the end of the year, when the government told Dasp to look into the matter; the agency concluded its investigation by corroborating the charges of administrative abuse (Benchimol, 2001, p.99).

Despite Fonseca Filho's prestige in the scientific community – at that time he was a member of the Deliberative Council of the National Council for Scientific and Technological Development (CNPq) – he could not bear the slander campaign, which, in his opinion, was instigated both by members of the DNS who were against the institute and by a group of researchers who perpetually waged opposition to the directors and who were at that time involved with a “group of Communists” (Fonseca Filho, 2010, p.43, 48). Fonseca Filho stepped down in July 1953. Researcher Cássio Miranda served as acting head until the January 1954 appointment of Francisco Laranja, physician with the Industrial Workers Retirement and Pension Institute and the first director who was not from the institute staff.

Concomitant with Fonseca Filho's resignation, the reform that would divide education and public health into two separate ministries was underway; one ministry would be devoted to education and culture and the other to health – in the latter case, an aspiration of public health workers since the latter half of the First Republic (Labra, 1985). The idea had resurfaced in the post-World War II period and the Lower House's Health Committee pushed hard to make it a reality, resulting in the drafting of a bill in 1950. Following a drawn-out debate in Congress, the proposal was approved in an emergency vote, with decisive influence from the Social Democratic Party (Partido Social Democrata, or PSD) – especially the parliamentarians and physicians Miguel Couto Filho and Alfredo Neves, both with connections to the governor of the state of Rio de Janeiro, along with Ernani Amaral Peixoto, chief leader of the PSD in that state and son-in-law to President Getúlio Vargas (Hamilton, Fonseca, 2003, p.815).¹⁵

The medical doctors and public health practitioners with ties to the former sanitary body approved of the initiative, which safeguarded their professional and political interests in that creation of the new ministry did not imply any major institutional change, with the DNS remaining its centerpiece. The reaction at the IOC was quite another matter, however. The atmosphere was still heated from the conflicts over Fonseca Filho's administration, prompting technical and scientific staff to take a rather unexpected attitude. In a petition addressed to Antônio Balbino, new Minister of Education and Culture, they asked that the IOC “remain” under the jurisdiction of that ministry (Memorial dos Técnicos..., 21 ago. 1953).¹⁶ A long list of justifications was given – for instance, the fact that the services to public health rendered by the institute had undeniably produced “invaluable feats” but that these now belonged to “the history of Brazilian medicine” and had at that moment become a mere matter of “routine.” They further argued that the structure of the new Ministry of Health should provide for the creation of a public health institute modeled after the National Institutes of Health, in the United States,

while the IOC should conduct “vital pure research,” as it had been doing from its very beginnings – research that had made essential contributions to biology and experimental medicine. In their view, this was how the institute could accomplish the directives to “advance medical science,” which recommended the “division of activities into research and applied theory” (Memorial dos Técnicos..., 21 ago. 1953). The “new” IOC, “resembling an ultra-university,” would fulfill the following functions:

Today Brazil must possess a center for biological research and culture, resembling an ultra-university, [that is,] the Oswaldo Cruz Institute, where scientific matters of either short- or medium-term interest are studied with a view to their solution, including issues of general biology, [and with a view to] refining current techniques of which there is still need, while also serving as a school for recruiting and training new researchers (Memorial dos Técnicos..., 21 ago. 1953).

The document, which expressed the intention to continue cooperating with the Ministry of Health, closed with an appeal for the minister to understand the reasons for needing to “preserve the core focus on scientific research, in place for more than fifty years at the IOC,” something that would only be possible “within the Ministry of Education’s culture division” (Memorial dos Técnicos..., 21 ago. 1953).

The petition revived the division of activities: public health tasks would be assigned to a specific institute while the IOC would concentrate on “pure” scientific research. But why revisit such a controversial question at that point in time?

Although the project was one and the same, the institutional context was not; first and foremost, this time the initiative originated within the IOC itself, with the list of signatures topped by the name of its interim director, Cássio Miranda. The clashes over Fonseca Filho represented only a part of the IOC’s institutional troubles, as we are informed by Haity Moussatche, one of the protagonists of these events:

We got into the battle to have the institute removed from public health, [that is,] from the Ministry of Health, because, in order to buy a device and do basic science, we had to lie and say we were buying animals, or something like that! . . . I mean, we were placed in a very secondary position here. . . . We felt there was an incredible barrier, because they thought the institute should make sera and vaccines, which we knew were of poor quality, and nobody knew how much that cost. If we were supposed to function like an industry, then we should have done so. . . . When they came along with this story about having to work only in terms of practical importance, I said: “Practical” There’s nothing more practical than a good theory!” It was Banting, the physicist, who said that (Moussatche, 1986, p.26-27).

Besides criticizing technical and administrative shortcomings in vaccine and serum production, which would be better produced by the pharmaceutical industry, Moussatche laid out the reasons for petitioning the Minister of Education and Culture: to be able to practice science without needing to justify this by producing practical applications and to be allowed to train researchers and structure a scientific career.

From this viewpoint, belonging to the Ministry of Health erected a ‘barrier,’ represented by the demand to make biological preparations for immunization purposes, a routine activity with no connection to research yet one that consumed resources that would be

better applied to research. Another investigator sharing these same ideas, Fernando Ubatuba, added this to the thoughts:

During a certain period, it was necessary to manufacture vaccines. It's an essential service for the country. What is not reasonable is to sacrifice, let's say, the "filet mignon" to accomplish a task that can and should be done by industry, much more competent, qualified, and entailing no sacrifice because that's its objective. ... In the first place, the institute is funded by the government, which doesn't provide enough resources. Secondly, we don't have the technicians or the equipment, which is very expensive. ... Research work at the IOC did not advance the way it would be expected, because the challenges to research kept getting bigger and bigger. ... The institute didn't have its own resources, it didn't have a research fund; it survived off government money. No money comes in, nothing gets bought. You can't do research if you don't have funds. The institute's equipment became outdated. The prices on apparatuses went up and it was a struggle to buy them. I spent seven years pleading, almost weekly, for the institute's administration to buy a spectrophotometer, an instrument that completely revolutionized biochemistry (Ubatuba, 1986, p.33-34).

From the outlook of these scientists, at that point belonging to the Ministry of Health was an onus they wished to be rid of, so they could conduct scientific research in a different way. In terms of tradition, this behavior represented a break with the social bases out of which the institute had grown. On the other hand, from the perspective of this new generation, the attempt to reshape an institutional model fifty years after its foundation afforded them an opportunity to adjust the institute to the social dynamics of the science of their era.

Transformations in the broader institutional setting were pointing in the direction of professional autonomy. The proponents of these changes were groups of scientists, comprised mainly of physicists and biologists, who in the post-World War II period took up political activism in hopes of redefining the social role of science within Brazilian society. Their main target was the government, to which they addressed their grievances: a full-time work schedule, better wages, funding, a combined research and teaching career, administrative autonomy, fellowships so scientists could train in Brazil and abroad, and other items seen as indispensable to the professionalization of research at the university and at public institutes. Organizing scientific work along these lines would ensure science its own autonomous space, without which it could not fulfill its duties to the society of its day.

These were the main rhetorical items on the platform of the "science party" (Burgos, 1999). The bulk of these grievances was attended to by the CNPq, itself in part a product of that movement (Andrade, 1999, p.109), and by the Coordinating Council for Training Higher Educational Level Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, or Capes), both of which were founded in 1951. Although their missions were distinct, both agencies worked towards goals that converged with the aspirations of scientists. While the CNPq funded scientific and technological investigation, Capes fostered the training of specialists and researchers by granting fellowships at home and abroad, in response to the demand created by industrialization and the public administration for skilled personnel with higher education (especially physicists, mathematicians, chemists, financial specialists, social researchers, and so on).¹⁷

The efforts of the CNPq and Capes contributed to molding a new standard in the institutionalization of scientific activities, at first limited to certain fields, especially physics and biology, but gradually extending into other areas. Over the next two decades, these two agencies fostered the institutional conditions for the emergence of a social dynamic that valued the professional role of scientists and that established institutional mechanisms for socialization, evaluation, and recognition, forged by the scientists themselves as the main protagonists of government policy.¹⁸

From the outset, this scientific and educational policy benefitted many institutions, as, for instance, the Biophysics Institute that Carlos Chagas Filho created at the University of Brazil in realization of the ideal of linking research to teaching and to researcher training. In the early 1950s, the institute was already enjoying a certain level of prestige in the Brazilian and world communities, thanks to its founder's colossal efforts to form a research team devoted to creating an innovative field of investigation, starting with studies on the Amazon electric eel (*Electrophorus electricus*) and from there moving into new research fronts, such as spreading depression and natural radioactivity.

Chagas Filho tied research activities in with a systematic program of short courses (refresher, specialization, extension, and advanced), with the participation of illustrious foreign researchers and professors, including Nobel Prize winners, whom he endeavored to engage in exchange initiatives and research collaboration that would provide his laboratory teams with training opportunities abroad and help assure their publication in foreign journals. The various strategies he employed to strengthen the institution and make its presence notable were in part supported by funds from CNPq and Capes, where he exercised influence through a distinguished circle of political and scientific relations and through the posts he held as director of the CNPq's Biological Research Division, in 1951-1953, and as a member of its Deliberative Council, in 1953-1956 (Azevedo, Lima, 2010; Lima, 2009).¹⁹

It may well be that this and similar other experiences²⁰ introduced at the university or with a university-like format contributed to feeding the IOC researchers' drive to have their institute detached from the Ministry of Health and given an "ultra-university" configuration. Their attitude was consonant with government policies, which encouraged expansion of the academic university model beyond the walls of the university.

The IOC itself had had a recent experience along these lines. Despite the controversies surrounding Olympio da Fonseca Filho's term of office, he made an innovative change in the field of teaching, similar to what occurred at the Biophysics Institute. Grounded in the premise that the specialized training course was out of step with the development of science, Fonseca Filho requested and received authorization from the Ministry of Education and Health to modify its curricular structure with an eye to interesting more people in the institute's fields of specialization (Brasil, 1949).

Three types of courses, all free, were created: general, specialized, and technical. The general courses offered broad specialized training in certain areas of study at the institute; the specialized courses explored pertinent issues of contemporaneous interest; and the technical courses, practical in nature, trained technicians and laboratory aides. Based on these guidelines, the specialized training course was defined as a "general course,"²¹ and it

was re-organized in didactic terms and its name changed to “course in bacteriology, immunology, and parasitology.”

Another novelty was allowing researchers and professors from other Brazilian and foreign institutions to serve on the teaching staff, rather than restricting it to institute personnel. For students, a new benefit was the receipt of scholarships in the form of stipends (Fonseca Filho, 1974, p.135). It was further stipulated that graduates could, if authorized by the director, continue their studies or begin researching as interns at any of the IOC’s scientific divisions, under the advisorship of a staff technician.

Animosities aside, the courses conducted during the period in question (Table 2) were taught by a number of researchers and professors from other Brazilian and foreign institutions, such as the National School of Philosophy, National Museum, Rural University, and São Paulo Bacteriological Institute. Jan Smith, an expert in soil microbiology from the Netherland’s Wageningen agricultural college, and Knud Krabbe, Danish embryologist and neurologist, also served as instructors.

Members of the IOC’s technical and scientific staff – most of whom were recent young graduates working as interns or lab assistants – attended many of the courses. Generally, however, the classes drew a clientele who wanted to specialize in the institute’s traditional fields of investigation, but there were also those interested in the new technologies and

Table 2: Specialization and advanced courses at the IOC (1949-1954)

Course/year	1949	1950	1951	1952	1953	1954
Bacteriology, immunology, parasitology	x	x	x	x	x	x
Biology	x					
Hematology	x	x	x			
German technology			x	x		
Electronics and electromicroscopy			x	x	x	
Protein chemistry			x			
Hydrobiology			x	x		
Phytopathology	x	x				
General entomology		x	x	x		
Soil microbiology		x				
Micromanipulation	x					
Biochemistry	x	x	x	x		
Mathematics applied to physics, chemistry, and biology			x	x		
Medical botany				x	x	x
Pathological histology practice				x		
Organic chemistry	x	x	x	x	x	x
Physiology, pharmacology, autonomic nervous system					x	
Exfoliative cytology, early diagnosis of cancer					x	
Biochemistry of vitamins					x	
Photomicrography			x	x		

Source: Fundo Instituto Oswaldo Cruz, 1949-1954

expertise then attracting growing attention, like electromicroscopy, chemistry, and biochemistry. The profiles of course participants in the latter two areas, who came from a diverse array of backgrounds in addition to medical schools, reveal certain features.

In 1950, twenty-six students enrolled in the biochemistry course, most holding a bachelor's degree in chemistry (12) or medicine (10); the remainder included one chemistry student, two graduates of pharmacy, and one of veterinary medicine. Most had studied at the University of Brazil, more specifically, at the National Chemistry School or National Medical School (Faculdade Nacional de Medicina). In terms of their professional backgrounds, three were IOC staff, two were employed by the Federal District, and one by the National Medical School. In gender terms, nine women were enrolled: five with degrees in industrial chemistry from the National School of Chemistry, two with diplomas in chemistry earned at the National School of Philosophy, and at the University of Budapest (both foreigners), one with a medical degree, and one with a degree in pharmacy.

The profile of students enrolled in the organic chemistry course that same year was somewhat narrower, since a degree in chemistry was an entrance requirement. Three of the ten enrollees had trained in industrial chemistry (one at the Technical School for Industrial Chemistry and two at the National School of Chemistry); two held diplomas in chemistry from the National School of Philosophy; and two had degrees in pharmacy from the National School of Pharmacy. The remaining three were women with chemistry degrees. In occupational terms, two of the men (a pharmacist and a chemist) were on the IOC staff, while one worked as a pharmacist with the Transportation and Cargo Workers Retirement and Pension Institute.

While these two courses had a new type of clientele, the profile of those taking the 1950 course in bacteriology, immunology, and parasitology was by and large the same as for the old specialized training course. The majority of its 29 students were medical graduates of the National Medical School or School of Medicine and Surgery in Rio de Janeiro, including one woman from the IOC's technical staff. The group also included three graduates in pharmacy and three in veterinary medicine. There were five foreigners as well: two Bolivians, one Paraguayan, an Argentinean, and a woman from Hungary.

The demand for these specialization courses provides an indication of the level of recognition attained by the IOC as a university-quality teaching institution, as proclaimed by the scientists who signed the manifesto to the Minister of Education and Culture. After all, the ideal of a university that embraces both research and teaching – an approach that had gained firm footing by then – had been in practice at the IOC long before it became an actual university reality. Further, the demand profile had to do with the restructuring of the university after the Capanema reform, especially the creation of the Schools of Philosophy, Science, and Letters. These schools offered a greater diversity of science courses and drew a new and different public to higher education, formerly confined to men from the upper classes. The old exclusivity of the elites contrasted with the steady response to demand from new social categories inside the middle classes and from an entirely new social agent, that is, urban women.

The social differentiation of the university population corresponded to the overall social differentiation prompted by the process of changes to Brazil's social structure, in

turn triggered by the advance of industrialization, accelerated urbanization, and aspirations of social mobility, associated with transformations to the labor market. Although this process became fully delineated only in the late 1960s, one decade earlier we can detect a variety of trends in different directions, as evinced by the demand for higher education on the part of the urban middle classes, who perceived this as a fertile path to a higher-ranking job. The 1950s pressure to expand the university system would lead the Ministry of Education and Culture to ‘federalize’ state, municipal, and private teaching establishments, and during this process new universities sprang up around the country. The strategy yielded unparalleled growth: in 1954, Brazil had 16 universities, 11 public and 5 private (Catholic and Protestant); by 1964, the number of public schools had jumped to 27, while private institutions had doubled to ten (Cunha, 2007).

The specialization and advanced courses held at the IOC during Fonseca Filho’s term of office were part and parcel of this expansion of higher education, and they met some of the expectations regarding professional training in research and teaching in the biological sciences. The IOC’s initiative also stood apart from previous experiences because of its university-like format and its emphasis on “basic” disciplines, which pointed toward the de-medicalization of biology. During the next decade, this phenomenon became patently clear on the international level, driven by entities like the Pasteur Institute (Gaudillière, 2002), from which Oswaldo Cruz drew his inspiration when building Manguinhos.

Although these courses were offered for only a short time, lacked continuity, and received harsh criticisms from Fonseca Filho’s adversaries, in practice they demonstrated a possible alternative route for the IOC, one that meant the institute would have to break away from public health – but, as we know, this did not happen. Yet the intention remained alive, inducing an internal tension that intensified after the 1964 military coup and culminated in the stripping of political rights from a number of scientists, including the signers of the 1953 manifesto.

The IOC disappeared as an autonomous institution shortly thereafter. Its incorporation into the Oswaldo Cruz Foundation – created in 1970 to house a set of Ministry of Health institutions – brought institutional inflexibility. Still, this abrupt modification did not end the institute’s history, as its fate entwined with that of Fiocruz, and this meant it eventually re-encountered its university ideals of the past. After all, in the 1980s, Fiocruz itself acquired university characteristics, implementing a complex, diversified graduate program encompassing the human sciences, which now constitutes Brazil’s largest graduate studies system outside a university environment.

Final considerations

Studies on the institutionalization of university teaching in Brazil have relegated to a subordinate position institutes of applied science like the IOC, which were heirs of the First Republic. With this as our point of departure, we have tried to demonstrate in these pages that more in-depth investigations into the IOC and its sister institutes are warranted. In exploring the development of higher education, how can we neglect half a century of

efforts to teach and train researchers and public health workers in then-emerging areas of biomedicine?

Forerunner of the university model that would become common at the graduate level starting only in the 1960s, this original institutional experiment came up against the lofty projects of the Vargas era, generating an unprecedented dilemma about its social role. Of particular note here, the establishment of the University of Brazil left evident the feasibility of dividing the IOC and thus indirectly strengthened the argument in favor of doing so. Yet incorporation into the University did not minimize existing tensions, whether owing to this model's centralizing format or to its stress on humanistic over scientific culture, preempting any true interaction with already existing research institutes. The University of Brazil in fact superimposed itself on them, behaving exactly the opposite of the University of the Federal District, which took advantage of the minds at its School of Sciences and also drew researchers from Manguinhos, the National Institute of Technology, and the Polytechnic School, where practical classes were given (Mendonça, 2002, p.124). Anísio Teixeira's "university inside the city" project, which presupposed collaboration with other institutions, stood in open opposition to the centralizing principles of the university project substantiated at the University of Brazil. While Teixeira saw the university as a center for producing and disseminating scientific knowledge at the service of "national progress," Capanema thought the University of Brazil should contribute to national integration, playing the part of guardian to higher education and standardizing it in Brazil. Such flagrant disagreements could come to no other end, and the University of the Federal District was abolished under a discretionary act handed down by Capanema.

Although the IOC did not suffer any process of de-institutionalization despite this context of major transformations, the institute did enter a phase of ongoing dilemma about its social identity, culminating with the manifesto of 1953. At that point in time, the request to be detached from the Ministry of Health was lodged in hopes of creating an institutional environment where there was administrative and intellectual autonomy to conduct research while simultaneously carrying out teaching duties. This was the meaning behind the actions taken by Manguinhos scientists, who were echoing sounds from beyond the institute's walls. While the project failed there, it advanced elsewhere, that is, at the Biophysics Institute, which proved exemplary in lending continuity to the tradition of the IOC. There Chagas Filho put in place an institutional format befitting a university environment not yet quite accustomed to scientific research, of which the university's professors were somewhat leery. Teaching basic disciplines at various schools of higher education, the team of researchers captivated students and drew them into the world of the laboratory.

NOTES

¹ In this and other citations of texts from Portuguese, a free translation has been provided.

² This organization of classes later saw a number of changes.

³ For an incomplete list of former students from 1917 to 1934, see Cortes, 1993.

⁴ Although Decree 16.782-A, which enacted the teaching reform, stipulated that the faculty should be made up of IOC technical staff, which were to be paid for this work (*pro labore*), it also authorized the

IOC director to hire other professionals if necessary and further rely on professors from the Medical School, with the agreement of its director. Castro Santos and Faria (2006, p.298) point out that the first group included Tobias Moscoso, from the Polytechnic School, and, from the DNSP, João de Barros Barreto, Antônio Fernandes Figueira, José Paranhos Fontenelle, and Plácido Barbosa.

⁵ The first class from the special course on hygiene and public health had twelve students, a number that dropped progressively, reaching four for the last course, held in 1938; from the course's first days, in 1926, a total of 78 public health doctors were trained (Labra, 1985 p.372).

⁶ Juvenil da Rocha Vaz was a member of a commission appointed by the Ministry of Justice and the Interior, João Alves, and charged with drafting general guidelines for the reform and especially for the teaching of medicine. At that time, Rocha Vaz, at the behest of Brazilian President Artur Bernardes (of whom Rocha Vaz was personal physician), held the posts of Director General of the National Department of Education, rector of the University of Rio de Janeiro, and director of the Medical School (Labra, 1985, p.293).

⁷ Dating to the days of Oswaldo Cruz, these hostilities reared their heads upon several occasions. Cruz's emergence as an intellectual leader had an impact on the medical field; a symbolic battle over the ownership of scientific authority was fought with old members of the medical community (Britto, 1995).

⁸ Other institutions mentioned in Decree 19.852, of April 11, 1931, which reorganized the University, were: National Museum, Astronomic Observatory, Geological and Mineralogical Service, Institute of Forensics, Institute of Chemistry, General Institute of Meteorology, Biological Institute for Agricultural Defense, Botanical Gardens, and Assistance for Psychopaths (Brasil, 1931b).

⁹ The National School of Philosophy was divided into philosophy, letters, pedagogy, and science. The last of these areas encompassed six courses: mathematics, physics, chemistry, natural history, geography, and history and social sciences (Paim, 1982, p.75).

¹⁰ João de Barros Barreto, physician and public health practitioner who graduated from the Rio de Janeiro Medical School in 1912 and student of the IOC's specialized training course (1915), specialized in public health at the Johns Hopkins School of Hygiene and Public Health and at Harvard's School of Public Health (1924-1925). He began his career as a public health worker with the National Service for Rural Prophylaxis in 1918, working in outlying areas of the federal capital and around the country. While on the staff of the DNSP, he taught industrial hygiene and hygiene at the Rio de Janeiro Medical School (1925-1936). Under the Getúlio Vargas administration, he rose to director of the National Health Department. On his trajectory, see Hochman, 2007.

¹¹ The new disciplines were: basics of heredity, eugenics and social issues of scientific interest and mental hygiene; physiology applied to hygiene; and nutrition. The other disciplines were: microbiology and immunology applied to public health; parasitology applied to public health; sanitary statistics; urban and rural sanitation; epidemiology and prevention of acute contagious diseases; epidemiology and prevention of transmitted diseases, especially rural endemic diseases; children's hygiene; industrial hygiene; public health administration and organization (Brasil, 1940b).

¹² Carlos Chagas Filho resigned because the Constitution of 1937 prohibited federal employees from holding more than one government post. This and other measures later enacted by DASP (created under Decree-Law 579, on July 30, 1938, and answering directly to the president of the republic) were meant to regulate the functioning of the civil service sector and elevate moral standards, which included making qualifying exams a hiring prerequisite.

¹³ The reform was enacted under Decree Law 3.171, dated April 2, 1941.

¹⁴ The fact that Aragão enjoyed such good relations with the federal government has attributed to his meeting its demands for biological preparations used for immunization purposes and chemical therapy drugs. The IOC's production area grew larger and more diversified once Brazil entered the war, with the institute contributing by manufacturing anti-gangrene serum, vitamin A concentrate, dry plasma, and penicillin. This cooperation was rewarded by funds for the construction of buildings and for purchasing modern laboratory equipment (Ferreira et al., 2002, p.20; Benchimol, 2001, p.86).

¹⁵ The Ministry of Health was established under Law 1.920, dated July 25, 1953. All human health agencies and services from the former Ministry of Education and Health were transferred to it. On the process of the creation of the Ministry of Health, see Hamilton and Fonseca, 2003.

¹⁶ The document had forty signatures, most of which can be found on the 1952 petition against Olympio da Fonseca Filho, but also including researchers and technicians involved in vaccine production, then the responsibility of the divisions of Microbiology and Immunology and of Virology. The document

further lists those who were absent (21) and those who refused to sign (6); figuring among the latter were Walter Oswaldo Cruz and Emanuel Dias, sons of Oswaldo Cruz and his brother-in-law, Ezequiel Dias.

¹⁷ Fellowships for study in Brazil and abroad were granted under the University Program, established in 1953 as the main line of activities involving universities and institutes of higher education. Other initiatives included support for the hiring of foreign visiting professors, promotion of exchange and cooperation between institutions, and funding of scientific events. On Capes and the leadership of Anísio Teixeira, see Gouvêa, Mendonça, 2006.

¹⁸ Under the control of scientists, the military, and civilians, the CNPq became the center for propagating a set of premises upon which its own operations were grounded: a) establishing the university as the main target of stimulus policy, so as to foster the link between research and the training of researchers; b) promoting more spaces for research, so as to expand Brazil's technical and scientific skills; c) emphasizing what were then called the "basic sciences" (likewise referred to as basic or pure research), viewed as the means for elevating the country's cultural level and developing applied research; d) changing the value scale so as to regulate scientific activity in accordance with professional standards of an academic nature (Ferreira et al., 2002).

¹⁹ Chagas Filho also benefitted from private patronage, from political relations that gave him access to parliament (which granted him resources through riders to the federal budget), and from donations and contributions of money as well as material and equipment from foreign businesses and scientific institutions and agencies, like Unesco and the Rockefeller Foundation. His broad circle of personal and political relationships guaranteed him access to these and other important sources of funding. On the Biophysics Institute and Chagas Filho's trajectory, see Azevedo, Lima, 2010; Lima, 2009; Almeida, 2008 and 2003; Mariani, 1982.

²⁰ Outstanding examples include: the Aeronautical Technological Institute (1947), the Brazilian Center for Physics Research (1949), the Institute of Pure and Applied Mathematics (1952), the University of São Paulo's School of Philosophy, Science, and Letters (1934), the National Department of Mineral Production (1934), and the National Technology Institute (1934). On these institutions, see Schwartzman, 2001; Andrade, 1999; Cunha, 2007; Castro, Schwartzman, 1981; Botelho, 1999.

²¹ The other general courses were physical chemistry, organic chemistry, biochemistry, biology, pathological processes, and tropical medicine (Brasil, 1949).

REFERENCES

ALMEIDA, Darcy.

A opção de Carlos Chagas Filho pela física biológica: razões e motivos. *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro, v.15, n.2, p.261-275, 2008.

ALMEIDA, Darcy.

Carlos Chagas Filho: do curso de graduação à cátedra de física biológica da Faculdade Nacional de Medicina, Universidade do Brasil (1926-1937). *Revista Rio de Janeiro*, Rio de Janeiro, n.11, p.135-147. 2003.

ANDRADE, Ana Maria Ribeiro.

Físicos, mésons e política: a dinâmica da ciência na sociedade. São Paulo; Rio de Janeiro: Hucitec; Museu de Astronomia e Ciências Afins. 1999.

ARAGÃO, Henrique.

Bases para a remodelação do Instituto Oswaldo Cruz. Rio de Janeiro. Arquivo Gustavo Capanema; série Ministério da Educação e Saúde/Saúde e Serviço Social, GC h 1935.05.27 (Fundação Getúlio Vargas/Centro

de Pesquisa e Documentação de História Contemporânea do Brasil). 4 fev. 1941.

AZEVEDO, Nara; LIMA, Ana Luce Soares de. *Carlos Chagas Filho: cientista brasileiro, profissão esperança*. Rio de Janeiro: Editora Fiocruz. 2010.

BARRETO, João de Barros.

Carta a Gustavo Capanema. Rio de Janeiro. Arquivo Gustavo Capanema; série Correspondência; rolo 59, fotograma 101 (Fundação Getúlio Vargas/Centro de Pesquisa e Documentação de História Contemporânea do Brasil). 1 jun. 1937.

BENCHIMOL, Jaime (Coord.).

Febre amarela: a doença e a vacina, uma história inacabada. Rio de Janeiro: Editora Fiocruz. 2001.

BENCHIMOL, Jaime.

Manguinhos do sonho à vida: a ciência na Belle Époque. Rio de Janeiro: Casa de Oswaldo Cruz/Fiocruz. 1990.

BOTELHO, Antonio.

Da utopia tecnológica aos desafios da política científica e tecnológica: o Instituto Tecnológico da Aeronáutica (1947-1967). *Revista Brasileira de Ciências Sociais*, São Paulo, v.14, n.39, p.139-154. 1999.

BRASIL.

Ministério da Educação e Saúde. Processo nº 56.394/52. Rio de Janeiro. Abaixo-assinado dos técnicos do Instituto Oswaldo Cruz. Fundo Instituto Oswaldo Cruz; seção Serviço Administrativo; série Administração Geral, cx.7, m.7. (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 27 maio 1952.

BRASIL.

Ministério da Educação e Saúde. Portaria Ministerial nº 331, de 1 de agosto de 1949. Rio de Janeiro. Fundo Instituto Oswaldo Cruz; seção Departamento de Ensino e Cursos. Documentos diversos, cx.7, m.17 (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 1949.

BRASIL.

Decreto nº 20.445, de 22 de janeiro de 1946. Aprova o Estatuto da Universidade do Brasil. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=153307&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 12 maio 2011. 1946.

BRASIL.

Decreto nº 9.388, de 13 de maio de 1942. Aprova o regulamento dos cursos de aperfeiçoamento e especialização do Departamento Nacional de Saúde, a que se refere o decreto-lei 4.296, de 13 de maio de 1942. Disponível em <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=6191&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 12 maio 2011. 1942.

BRASIL.

Decreto nº 3.171, de 2 de abril de 1941. Reorganiza o Departamento Nacional de Saúde, do Ministério da Educação e Saúde, e dá outras providências. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=18312&tipoDocumento=DEL&tipoTexto=PUB>. Acesso em: 12 maio 2011. 1941.

BRASIL.

Decreto-lei nº 2.243, de 29 de maio de 1940. Anexa ao Instituto Oswaldo Cruz o curso de Higiene e Saúde Pública, a que se refere o decreto 19.852, de 11 de abril de 1931, e dá outras providências. Disponível em: [http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=35295&tipoDocumento=](http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=35295&tipoDocumento=DEL&tipoTexto=PUB)

DEL&tipoTexto=PUB. Acesso em: 12 maio 2011. 1940a.

BRASIL.

Decreto nº 5.738, de 29 de maio de 1940. Aprova o Regulamento do Curso de Saúde Pública a que se refere o decreto-lei 2.243, de 29 de maio de 1940. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=98683&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 23 set. 2011. 1940b.

BRASIL.

Decreto-lei nº 579, de 30 de julho de 1938. Organiza o Departamento Administrativo do Serviço Público, reorganiza as Comissões de Eficiência dos Ministérios e dá outras providências. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=100812&tipoDocumento=DEL&tipoTexto=PUB>. Acesso em: 22 set. 2011. 1938.

BRASIL.

Decreto-lei nº 82, de 18 de dezembro de 1937. Incorpora o Instituto Nacional de Saúde Pública ao Instituto Oswaldo Cruz e define as atribuições deste. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=103213&tipoDocumento=DEL&tipoTexto=PUB>. Acesso em: 22 set. 2011. 1937a.

BRASIL.

Lei nº 378, de 13 de janeiro de 1937. Dá nova organização ao Ministério da Educação e Saúde Pública. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=102716&tipoDocumento=LEI&tipoTexto=PUB>. Acesso em: 22 set. 2011. 1937b.

BRASIL.

Presidência da República. Ministério da Educação e Saúde Pública. *Plano de reorganização do Ministério da Educação e Saúde Pública, apresentado ao Poder Legislativo pelo Presidente da República*. Rio de Janeiro: Imprensa Nacional. 1935.

BRASIL.

Decreto nº 19.851 de 11 de abril de 1931. Dispõe que o ensino superior no Brasil obedecerá, de preferência, ao sistema universitário... Disponível em: <http://www.senado.gov.br/legislacao/Acesso> em: 4 maio 2012. 1931a.

BRASIL.

Decreto nº 19.852, de 11 de abril de 1931. Dispõe sobre a organização da Universidade do Rio de Janeiro. Disponível em:

http://www.planalto.gov.br/ccivil_03/decreto/1930-1949/D19852.htm. Acesso em: 13 set. 2011. 1931b.

BRASIL.

Decreto nº 16.782-A, de 13 de janeiro de 1925. Estabelece o concurso da União para a difusão do ensino primário, organiza o Departamento Nacional do Ensino, reforma o ensino secundário e o superior e dá outras providências. Disponível em: <http://www.camara.gov.br/internet/infdoc/novoconteudo/legislacao/republica/Leis1925v2-772p/L1925-08.pdf#page=9>. Acesso em 10 set. 2011. 1925.

BRASIL.

Decreto nº 13.527, de 26 de março de 1919. Reorganiza o Instituto Oswaldo Cruz. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=49587&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 13 out. 2011. 1919.

BRASIL.

Decreto nº 6.891, de 19 de março de 1908. Aprova, para o Instituto de Patologia Experimental de Manguinhos, que passa a denominar-se Instituto “Oswaldo Cruz”, o regulamento a que se refere o artigo 3º do decreto 1.802, de 12 de dezembro de 1907. Disponível em <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=61674&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 5 maio 2011. 1908.

BRASIL.

Decreto nº 1.802, de 12 de dezembro de 1907. Cria um Instituto de Patologia Experimental de Manguinhos. Disponível em: <http://www6.senado.gov.br/legislacao/ListaPublicacoes.action?id=57555&tipoDocumento=DEC&tipoTexto=PUB>. Acesso em: 12 maio 2011. 1907.

BRITTO, Nara.

Oswaldo Cruz: a construção de um mito na ciência brasileira. Rio de Janeiro: Editora Fiocruz. 1995.

BURGOS, Marcelo.

Ciência na periferia: a luz síncrotron brasileira. Juiz de Fora: EdUFJF. 1999.

CASTRO, Maria Helena Magalhães;

SCHWARTZMAN, Simon.

Tecnologia para a indústria: a história do Instituto Nacional de Tecnologia. Disponível em <http://www.schwartzman.org.br/simon/int/int.htm>. Acesso em: 12 set. 2011. 1981.

CASTRO SANTOS, Luiz Antônio de; FÁRIA, Lina.

O ensino da saúde pública no Brasil: os

primeiros tempos no Rio de Janeiro. *Trabalho, Educação e Saúde*, Rio de Janeiro, v.4, n.2, p.291-324. 2006.

CHAGAS FILHO, Carlos.

Carlos Chagas Filho (Depoimento, 1976/1977). Rio de Janeiro: CPDOC. 2010.

CHAGAS FILHO, Carlos.

Um aprendiz de ciência. Rio de Janeiro: Nova Fronteira; Editora Fiocruz. 2000.

CHAGAS FILHO, Carlos.

[Depoimento]. Rio de Janeiro. Casa de Oswaldo Cruz/Fundação Oswaldo Cruz. Programa de História Oral, Fita 5, 1991.

CHAGAS FILHO, Carlos.

Novas diretrizes da pesquisa científica. Exposição de motivos apresentada ao Sr. Ministro de Educação e Saúde. Rio de Janeiro. Arquivo Gustavo Capanema; série Ministério da Educação e Saúde/Saúde e Serviço Social, GC h 1935.05.27 (Fundação Getúlio Vargas/Centro de Pesquisa e Documentação de História Contemporânea do Brasil). 14 jan. 1941.

CORTES, Bianca Antunes.

Mestres e aprendizes: a iniciação do cientista em Manguinhos nos tempos de Oswaldo – 1900/1915. Dissertação (Mestrado) – Faculdade de Educação, Universidade Federal Fluminense, Niterói. 1993.

CUNHA, Luiz Antônio.

A universidade crítica: o ensino superior na república populista. São Paulo: Edunesp. 2007.

CUNHA, Luiz Antônio.

A universidade temporária: o ensino superior da Colônia à Era Vargas. Rio de Janeiro: Civilização Brasileira. 1980.

DINIZ, Eli.

Engenharia institucional e políticas públicas: dos conselhos técnicos às câmaras setoriais. In: Pandolfi, Dulce (Org.). *Repensando o Estado Novo*. Rio de Janeiro: Editora FGV. p.21-38. 1999.

FAUSTO, Boris.

A Revolução de 1930: historiografia e história. São Paulo: Companhia das Letras. 2008.

FERREIRA, Luiz Otávio et al.

Entre o básico e o aplicado: práticas e tradições de pesquisa no Instituto Oswaldo Cruz (1935-1970). Relatório de Pesquisa. 2002.

FONSECA, Cristina.

A criação da Ensp: integração e diversidade na formação em saúde pública. In: Lima, Nísia; Fonseca, Cristina; Santos, Paulo Elian dos

(Org.). *Uma escola para a saúde*. Rio de Janeiro: Editora Fiocruz. p.39-77. 2004.

FONSECA, Cristina.

Práticas sanitárias ou práticas pedagógicas? A institucionalização das atividades de educação em saúde no 1º governo Vargas (1930-45). In: Magaldi, Ana Maria; Alves, Claudia; Gondra, José G. (Org.) *Educação no Brasil: história, cultura e política*. Bragança Paulista: Edusf. p.463-487. 2003.

FONSECA FILHO, Olympio Oliveira Ribeiro. *Olympio da Fonseca (Depoimento, 1977)*. Rio de Janeiro: CPDOC. 2010.

FONSECA FILHO, Olympio Oliveira Ribeiro. *A Escola de Manguinhos: contribuição para o estudo do desenvolvimento da medicina experimental no Brasil*. Separata do t.2 de Oswaldo Cruz. Monumenta Histórica. São Paulo. 1974.

FONTES, Antônio Cardoso.

Relatório dos serviços executados pelo Instituto Oswaldo Cruz no exercício de 1936. Rio de Janeiro. Fundo Instituto Oswaldo Cruz; seção Serviço de Administração; série Administração Geral, cx.26, m.4. (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 1937.

FUNDO INSTITUTO OSWALDO CRUZ.

Seção Departamento de Ensino e Cursos; série Documentos Diversos. (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 1949-1954.

GAUDILLIÈRE, Jean-Paul.

Inventer la biomedicine: la France, l'Amérique et la production de savoirs du vivant (1945-1965). Paris: La Découverte. 2002.

GOMES, Ângela de Castro.

O primeiro Governo Vargas: projeto político e educacional. In: Magaldi, Ana Maria; Alves, Claudia; Gondra, José G. (Org.) *Educação no Brasil: história, cultura e política*. Bragança Paulista: Edusf. p.445-462. 2003.

GOUVÊA, Fernando; MENDONÇA, Ana Waleska.

A contribuição de Anísio Teixeira para a institucionalização da pós-graduação no Brasil: um percurso com os boletins da CAPES. *Perspectiva*, Florianópolis, v.24, n.1, p.111-132. 2006.

HAMILTON, Wanda; FONSECA, Cristina.

Políticas, atores e interesses no processo de mudança institucional: a criação do Ministério da Saúde em 1953. *História, Ciências, Saúde – Manguinhos*. Rio de Janeiro, v.10, n.3, p.791-825. 2003.

HOCHMAN, Gilberto.

João de Barros Barreto. In: Bynum, William. F.; Bynum, Helen (Ed.). *Dictionary of medical biography*. 5 v. Oxford: Greenwood Press. 2007.

HOCHMAN, Gilberto.

A era do saneamento. São Paulo: Hucitec; ANPOCS. 1998.

HOCHMAN, Gilberto; FONSECA, Cristina.

O que há de novo? Políticas de saúde pública e previdência (1937-45). In: Pandolfi, Dulce (Org.). *Repensando o Estado Novo*. Rio de Janeiro: Editora FGV. p.73-93. 1999.

KROPF, Simone.

Doença de Chagas, doença do Brasil: ciência, saúde e nação (1909-1962). Rio de Janeiro: Editora Fiocruz. 2009.

LABRA, Maria Eliana.

O movimento sanitarista nos anos 20: da conexão sanitária internacional à especialização em saúde pública. Dissertação (Mestrado) – Escola Brasileira de Administração Pública, Fundação Getúlio Vargas, Rio de Janeiro. 1985.

LIMA, Ana Luce Soares de.

Ciência e política no Brasil: Carlos Chagas Filho e o Instituto de Biofísica (1931-1951). Tese (Doutorado) – Casa de Oswaldo Cruz, Fundação Oswaldo Cruz, Rio de Janeiro. 2009.

LIMA, Nísia; FONSECA, Cristina.

História da especialização em saúde pública. In: Lima, Nísia; Fonseca, Cristina; Santos, Paulo Elian dos (Org.). *Uma escola para a saúde*. Rio de Janeiro: Editora Fiocruz. p.25-38. 2004.

MARIANI, Maria Clara.

O Instituto de Biofísica da UFRJ. In: Schwartzman, Simon (Org.). *Universidades e instituições científicas no Rio de Janeiro*. Brasília: CNPq. p.199-208. 1982.

MEMORIAL DIRIGIDO...

Memorial dirigido ao Magnífico Reitor da Universidade do Brasil, prof. Ignacio de Azevedo Amaral, por Chefes de Divisão, Chefes de Seção e demais Biologistas do Instituto Oswaldo Cruz, pedindo o restabelecimento da antiga autonomia do Instituto o qual havia sido recentemente incorporado à Universidade do Brasil, pelo Decreto n. 20.445, de 22 de janeiro de 1946. Rio de Janeiro. Fundo Carlos Chagas Filho; BR RJCOC CF (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 7 fev. 1946.

MEMORIAL DOS TÉCNICOS...

Memorial dos Técnicos do Instituto Oswaldo Cruz ao Exmo. Sr. Ministro da Educação e Cultura solicitando a permanência do Instituto

como órgão integrante do MEC. Rio de Janeiro. Fundo Instituto Oswaldo Cruz; Seção Administração Geral, cx.7, m.2 (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). 21 ago. 1953.

MENDONÇA, Ana Waleska.
Anísio Teixeira e a universidade de educação. Rio de Janeiro: Eduerj. 2002.

MOUSSATCHE, Haity.
[Depoimento]. Rio de Janeiro, Casa de Oswaldo Cruz/Fiocruz, Programa de História Oral, Projeto Memória de Manguinhos, Fita 2, 1986.

PAIM, Antônio.
Por uma universidade no Rio de Janeiro. In: Schwartzman, Simon (Org.). *Universidades e instituições científicas no Rio de Janeiro*. Brasília: CNPq. p.17-96. 1982.

REGISTRO DE ALUNOS QUE OBTIVERAM DIPLOMAS...
Registro de alunos que obtiveram diplomas e certificados (1940-1951). Fundo Instituto Oswaldo Cruz; seção Departamento de Ensino e Cursos; série Curso de Higiene e Saúde Pública, cx.1, m.2 (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). s.d.

RELAÇÃO DOS ALUNOS APROVADOS...
Relação dos alunos aprovados no curso de aplicação do Instituto Oswaldo Cruz (1911-1949). Fundo Instituto Oswaldo Cruz; seção Departamento de Ensino e Cursos; série Curso de Higiene e Saúde Pública, cx.1, m.2 (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). s.d.

RELAÇÃO DOS ALUNOS QUE SE INSCREVERAM...

Relação dos alunos que se inscreveram nos cursos de aplicação do Instituto Oswaldo Cruz desde a sua fundação. Fundo Instituto Oswaldo Cruz; seção Departamento de Ensino e Cursos; série Curso de Higiene e Saúde Pública, cx.1, m.1 (Fiocruz/Casa de Oswaldo Cruz, Departamento de Arquivo e Documentação). s.d.

SANTOS, Wanderley Guilherme.
Cidadania e justiça. Rio de Janeiro: Campus. 1979.

SCHWARTZMAN, Simon.
Um espaço para a ciência: a formação da comunidade científica no Brasil. Brasília: MCT/CET. 2001.

SCHWARTZMAN, Simon; BOMENY, Helena Maria Busquet; COSTA, Vanda Maria Ribeiro.
Tempos de Capanema. São Paulo: Paz & Terra; Fundação Getulio Vargas. 2000.

STEPAN, Nancy.
Gênese e evolução da ciência brasileira. Rio de Janeiro: Artenova. 1976.

UBATUBA, Fernando.
[Depoimento]. Rio de Janeiro. Casa de Oswaldo Cruz/Fiocruz, Programa de História Oral, Projeto Memória de Manguinhos, Fita 3, 1986.

WILLIAMS, Daryle.
Gustavo Capanema, Ministro da Cultura. In: Gomes, Ângela de Castro (Org.). *Capanema: o ministro e seu ministério*. Rio de Janeiro: Editora FGV. p.251-269. 2000.

