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# PSYCHOTECHNICS IN THE NETHERLANDS

PIETER J. VAN STRIEN
*University of Groningen*[1]

ABSTRACT

The history of applied psychology in the Netherlands in the first half of the 20th century offers an interesting case of the role of instruments in the identity of an emerging profession. In common with other European countries applied psychology was introduced in the Netherlands under the banner of psychotechnics. And though psychothecnics was understood in the broad sense of Hugo Münsterberg's (1914) definition as "the application of psychology in the service of cultural objectives", its development was, just as elsewhere in Europe, restricted mainly to vocational guidance and personnel selection. It must be acknowledged that there was also a keen interest in psychology on the part of Dutch psychiatrists and pedagogues in the first decades of the 20th century, but they did not conceive their work as applied psychology, and certainly not as psychotecnics. Psychotechnics, in its strict sense, became a matter of testing aspiring or insecure youngsters, and of applicants for a job in industry, trade and traffic. As will appear below, the test, as the principal diagnostic instrument, played a central role in the way the pioneers of this new field secured a niche in Dutch society. Yet, the "tests" to which the subjects of early diagnostic investigation were subjected hardly resembled the paper and pencil tests that form the *pièce de resistance* of present testing practice. Let us now follow the development of the "testing business" in the Netherlands more in detail.

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RESUMEN

La historia de la psicología aplicada en los Países Bajos durante la primera mitad del siglo 20 ofrece un interesante ejemplo del papel que los instrumentos jugaron en la conformación de la identidad de una profesión emergente. En forma similar a lo que sucedió en otros países europeos, la psicología aplicada se introdujo en los Países Bajos bajo el estandarte de la psicotecnia. Y, aunque ésta se entendió en el amplio sentido de la definición de Hugo Münsterberg (1914), como "la aplicación de la psicología al servicio de objetivos culturales", su desarrollo quedó, prácticamente como en el resto de Europa, restringido principalmente a la orientación vocacional y la selección de personal. También debe reconocerse el profundo interés que hacia la psicología mostraron los psiquiatras y pedagógos holandeses en las primeras décadas del siglo XX, si bien nunca concibieron su trabajo como psicología aplicada, y desde luego tampoco como psicotecnia. La psicotecnia, en su más estricto sentido, se convirtió en un tema de evaluar mediante tests a jovencitos ambiciosos o inseguros, y candidatos para un empleo en la industria, el comercio y el tráfico. Como se indicaba más arriba, el test, como principal instrumento para el diagnóstico, desempeñó un papel central en la estrategia que los pioneros de este nuevo campo siguieron para asegurarse una buena posición en la sociedad holandesa. Los "tests" a los que fueron sometidos los sujetos de las primeras investigaciones diagnósticas apenas se parecen a los tests de lápiz y papel que conforman el *núcleo principal* de la actual práctica con tests. El artículo sigue, detalladamente, el desarrolla de la "empresa de los tests" en los Países Bajos.

The history of Dutch applied psychology in the first half of the 20th century offers an interesting case of the role of instruments in the identity of an emerging profession. In common with other European countries[2], applied psychology was introduced in the Netherlands under the banner of psychotechnics. Although psychotechnics was understood in the broad sense of Hugo Muensterberg's (1914) definition as "the science of the practical application of psychology in the service of culture" (Wissenschaft von der praktischen Anwendung der Psychologie im Dienste der Kulturauf-

[2] For an overview of the history of work and organizational psychology in general, see Shimmin & van Strien, 1998).

gaben), its development was, just as elsewhere in Europe, restricted mainly to vocational guidance and personnel selection. It is true that there also was a keen interest in psychology on the part of Dutch psychiatrists and pedagogues in the first decades of the 20th century, but they did not conceive of their work as applied psychology, and certainly not as psychotechnics. Psychotechnics, in its strict sense, became a matter of testing aspiring or insecure youngsters, as well as job applicants in industry, trade and traffic. As demonstrated below the test, as the principal diagnostic instrument, played a central role in the way the pioneers of this new field secured a niche in Dutch society. Yet, the "tests" to which the subjects of early diagnostic investigation were subjected hardly resembled the paper and pencil tests that form the piece de resistance of present testing practice. Let us now follow the development of the "testing business" in the Netherlands more in detail.

## THE PIONEER PERIOD

The few small psychological laboratories with which some professors of psychiatry or physiology equipped their university department aside, the psychological laboratory of the University of Groningen, founded in 1892 by philosopher-psychologist Gerard Heymans (1857-1930), was the only centre of scientific psychological research in The Netherlands up to the end of World War I. Heymans certainly approved of the use of psychology in psychiatry and education, and in his famous rectorial oration in 1909 even had sketched the perspective of the "Future Century of Psychology"[3]. Yet he had, just as German pioneers like Wilhelm Wundt, strong reservations toward a "premature" application of the new science. As industrialization came late to the Netherlands and the country did not get involved in World War I, Dutch society was slow to utilize psychology as an aid to solve practical problems. It was only after armistice that a fresh wind swept the country bringing an interest in socioeconomic and cultural renewal. As part of this new spirit there was hope that psychology, in its applied form of psychotechnics, would contribute innovative solutions to the problems and challenges the nation confronted.

The first initiatives to make use of psychology came not from the universities but from other quarters of Dutch society (Eisenga, 1978). Credit for priority goes to the "Centraal Zielkundig Beroepskantoor" of the

[3] Heymans oration was translated into German, French and Italian. The German translation can be found in his Gesammelte kleinere Schriften, II (1927).

Catholic labour Union, founded on the proposal of father- Jesuit and linguist Dr. Jaques van Ginneken (1918). Hundreds of labourers were tested here for vocational fitness. A second initiative came from the Dr. D. Bos Foundation, who founded the Social Pedagogical Dr. D. Bos Institute in 1920, a centre of psychotechnical research, that, though a private institution, was affiliated with the Heymans Laboratory at the University of Groningen. The city of Amsterdam followed by founding in 1921 a Psychotechnical Laboratory as part of its municipal health service. The first industrial company to found a psychotechnical laboratory was Philips Light Bulb Company in Eindhoven (1922). In the course of the nineteentwenties and -thirties several other psychotechnical laboratories were founded, some attached to a university, some as part of the personnel department of a large company. The first private testing firm, the Nederlandse Stichting voor Psychotechniek, was founded at Utrecht in 1927.

When we examine the diagnostic practice of these laboratories, we come across all four modalities in the instrumentation of applied psychology I have identified elsewhere (van Strien, 1997). From an historical perspective the first two categories are the most interesting, because they are most at variance with our present tests. The first (1) consists of the use of "classical" laboratory apparatus, originally designed for the measurement of general-psychological functions, for differential purposes. The second category (2) includes a variety of often very ingenuous "psychotechnical" apparatus, especially constructed to represent aspects of the task. It consists of two subcategories: (2a) apparatus meant to measure just one psychological quality supposed to be relevant to the task (e.g. deliberate reaction), and (2b) job-miniature tests, consisting of devices that formed a simulation of the task situation (the British psychologist Charles S. Myers, 1926, speaks of "analogous tests"). In the literature this second subcategory is often labelled the "synthetic approach", in contrast to the "analytic approach" of the first subcategory, where the job requirements, as in the classical laboratory situation, are reduced to elementary functions. (3) Simple performance tests and paper-and- pencil tests, the category that predominates in present testing practice. Again, two subcategories can be discerned here: (3a) individually administrated tests, such as the Binet scale and its derivatives, and (3b) tests that can be administered to groups - the standard paper-and-pencil variant. The last category (4) consists of personality tests in the broadest sense. Not only typical personality scales, projective tests, and tests of expression belong to this category, but also the observational, "qualitative" use of apparatuses or tests that originally were developed from the perspective of one of the foregoing categories for the qualitative appraisal of the "structure" of the capacities and personality

of the testee. I shall now illustrate each of the four categories on the basis of the testing practice of one or more psychotechnical laboratories in the Netherlands. It will appear that in none of the early laboratories there has been a "monoculture" of just one approach; yet there were substantial differences in the mix of testing devises.

## APPARATUS-TESTING IN THE HEYMANS LABORATORY

The most typical examples of the use of laboratory apparatus for diagnostic purposes are offered by research conducted at the Dr. Bos Institute, attached to the Heymans Laboratory at the University of Groningen. For a better understanding I start with a brief general sketch of the work at the Heymans laboratory. Though Heymans' primary concern had been to establish the fundamental laws of consciousness (viz. Van Strien, 1993), his interests changed around the turn of the century, and he directed his attention to differential psychology. On the basis of biographical studies and correlational analysis of character ratings in a large-scale questionnaire conducted together with the Groningen psychiatrist E. D. Wiersma, he developed a typology based on three fundamental dimensions: activity, emotionality, and secondary vs. primary functioning (Heymans 1908). It was his hope that popularisation of his typology would contribute to a better understanding among people.

Further research at the laboratory epitomizes the gradual transition from the laboratory to the outside world, and the concomitant use of laboratory instruments for practical purposes. In collaboration with his assistant Henri Brugmans, Heymans organised a practicum in 1911/1912, aimed at the study of fundamental determinants of intellectual achievement, evidently for educational purposes (Heymans & Brugmans, 1912). In this practicum his students were subjected to a series of laboratory experiments covering the following elementary psychic functions: memory, liveliness of fantasy, concentration, secondary functioning and intellect. To measure these functions a number of "experiments or tests" was administered, and their mutual correlations were determined. The indebtedness to traditional laboratory psychology is apparent in the employment of apparatus like the metronome and the mnemometer of Ranschburg for the examination of memory, the colour disc, the light screen and the light-inhibition experiments of Wiersma for the determination of secondary functioning, and the dotting apparatus (Burt) and a phonometer for the determination of concentration. The apparatuses used are depicted in the apparatus-catalogue of the Netherlands Foundation for Historical Materials (Hartevelt, 1989), and also partly in the catalogue of the Heymans Centenary Exhibition (Draaisma,

1992). The other "tests" used in the practicum consisted of simple tasks such as recognition of colours, description of pictures, repeating a story, word and picture puzzles, and the like (the third category, to which I will come later). Though he certainly was aware of them, Heymans made no use of the Binet scales for the measurement of intelligence, and he did not calculate correlations between intel ligence and the other functions measured or between those functions and some criterion of academic success. Apparently Heymans and Brugmans were convinced of the significance of the five functions beforehand, probably because prior inquiries into academic performance (especially of woman) had already demonstrated their relevance (Heymans, 1910).

The step from the laboratory to the outside world was completed in the work of theDr. D. Bos Institute. As I mentioned already, this institute was not an initiative of Heymans himself but a private institution. It was supported financially by a legacy of the well-known socialist politician Dr. D. Bos. This Bos-Institute set itself the task, in close collaboration with the Heymans Laboratory, to lay the scientific basis for vocational guidance and personnel selection. In his opening address Heymans' disciple Brugmans, who was appointed director, made clear that the Institute was not intended to be a service institute itself, but was aimed to examine the requirements for different jobs and to select the proper experiments and tests for bringing the right men to the right place. By making the outcomes available to pioneering local bureaus elsewhere the Institute would serve as Central Institute for vocational psychology in the Netherlands (Brugmans, 1921).

The manner in which Brugmans conducted his research is a perfect illustration of the indebtedness of early applied psychology to classical laboratory psychology which I have elaborated elsewhere (Van Strien, 1998). This indebtedness manifests itself both in the initial use of laboratory apparatus as diagnostic tools and in the conception of vocational fitness as a matter of the same elementary mental functions as those measured in the laboratory.

The first job studied was telephone operator. The methodological basis of the procedure consisted of a mental analysis of the requirements of the job. Ten psychological functions were deemed relevant to the task, and each was measured by a number of "tests". The quotation marks - used in the original publication (Brugmans & Prak, 1921) – are justified, because only a few of the measuring devices, such as the Bourdon-Wiersma cancellation test, were tests by today's standards. Many "tests" consisted of typically traditional laboratory experiments now used for a differential purpose. The tachistoscope, the fall-phonometer and similar instruments were employed, and reactions were measured in hundreds of seconds with the chronoscope of Hipp and registered with the chronograph of Jaquet.

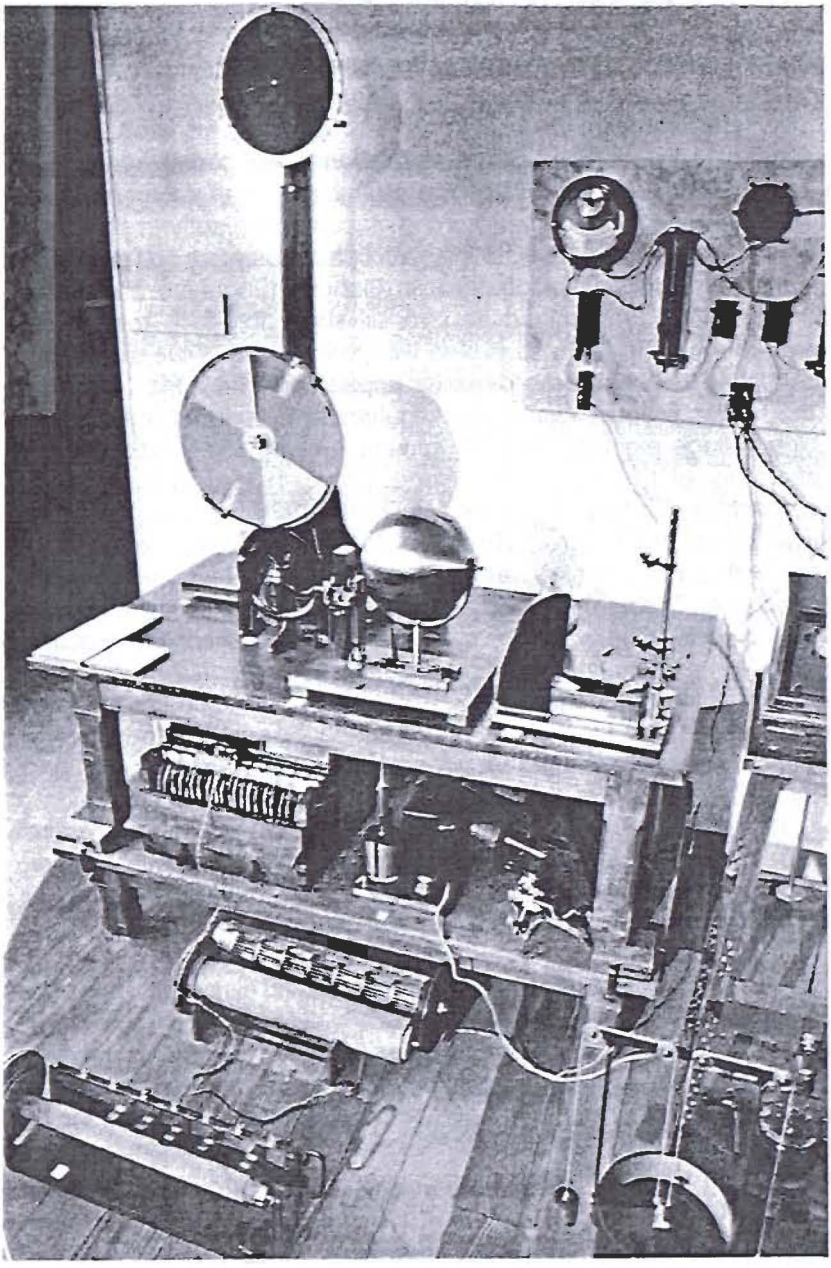

Figure 1.- A corner of the Heymans laboratory

In addition some especially devised apparatuses, such as the teleometer and the tremometer, were used - apparatus belonging to the second modality to which I shall return in the next section. The tests were administered to thirteen women at the telephone exchange; correlations were calculated between the ranking of the operators on each test and the ranking of the supervisor. Some correlations were negative and some were zero, but most were positive. The probable error of each correlation was also determined. On the basis of the outcomes the authors discussed the value of the respective tests for the selection of operators and compared the results with similar investigations in Geneva (Fontegne and Solari, 1918). Finally they determined an over-all score for each testee, and compared the ranking of these scores with the ranking of the supervisor. The correlation between both rankings appeared to be >.90.

In the following years similar investigations were carried out on other jobs: high voltage electric fitters (Brugmans & Prak, 1922), assistants in the Laboratory of Philips Electric Works (Prak, 1926a), apprentices in Stork's Machine Factory (Brugmans & Prak, 1926) and pupils of the Technical School at Eindhoven (Prak, 1926b). Furthermore, investigations were conducted in a teachers seminar and in several elementary schools and highschools. The general approach was the same as with the telephone-operators. A difference was, however, that - the pupils of the teachers seminar aside - the investigations were conducted outside the laboratory. This made it difficult to use complicated apparatus. The Hipp-chronoscope was used on site, but for the rest rigorous adaptations had to be made. In the school investigations the tachistoscope and the mnemometer were fitted for administration in the classroom by projecting the stimuli on a screen. In the industrial investigations the psychological functions that were expected to be relevant were occasionally measured with the help of a simple instrument in the line of category 1 or 2a, but for the remainder by means of individually administered paper and pencil tests and simple performance tests.

Just as in other laboratories in the Netherlands and elsewhere in Europe "testing" inthe style of the first category gradually passed into disuse at the Bos-Institute. By the end of the twenties the institute was past its peak anyhow. Prak more and more became involved in his work at Philips Electric Company, where he had been employed since 1924 as an industrial psychologist. After Heymans' retirement in 1928 Brugmans was appointed full professor in general psychology and soon handed over the work at the Bos-Institute to his assistant Tonko ten Have who was also appointed director of the Groningen Bureau for Vocational Guidance in 1932. No more studies of the kind just described were conducted. The laboratory instruments were still used in the practica of university students

and were displayed at the 1936 Psychotechnical Exhibition at Amersfoort (see Catalogus, 1936). In his testing practice, however, ten Have employed mainly simple paper-and-pencil and performance tests (our third category). And in the diagnostic interpretation of the outcomes he proceeded partly (in line with our fourth category) in a qualitative way, making use of the newly introduced German characterological and psychodiagnostic theories (ten Have, 1937, see also ten Have, 1947). In doing so he departed not only from the laboratory method, but also from the concomitant elementaristic, additive way of thinking.

## THE EMERGENCE OF SPECIFIC PSYCHOTECHNICAL APPARATUS

In our survey of the methods used by the Bos Institute we already came across some apparatuses which were especially devised for differential purposes, such as the tremometer and the teleometer. The tremometer (trembling test) was a device in which the testee had to follow a narrow track with a metal stylus which produced an electric circuit as soon as it touched the metal plate in which the track was cut. The teleometer (aiming test) was a test in which the testee had to hit with a needle small circles, appearing behind a metal window, under time pressure -a task which resembled the handling of the switchboard of the hand- operated telephone exchanges of those days. In fact this test showed the highest correlation with job performance (.80) of all tests used by Brugmans in his research on telephone operators.

In the other early psychotechnical laboratories the use of especially constructed psychotechnical apparatus (category 2) soon outstripped that of laboratory apparatus. Particularly in Germany, where many among the pioneers of psychotechnics were engineers, there was a veritable boom in the construction of apparatus. In a historical survey of vocational diagnostics Hermann (1966) speaks of "an inflation of apparatus". Having some new test or apparatus to one's credit became a matter of prestige. The newly created German psychotechnical journals Industrielle Psychotechnik, Praktische Psychologie and Psychotechnische Zeitschrift, and books such as Baumgarten's Berufseignungspruefungen (1928), Giese's Handbuch (1925), and Moede's Lehrbuch (1930), carried scores of pictures of apparatus and testing devices that were developed in this period. Synthetic devices in which a vital aspect of the task situation was simulated (category 2b) exercised, because of their greater nearness to life, a stronger appeal on the pioneers of the new field than analytic devises in the line of category 1 or 2a, designed for measuring only one of the psychological functions that were supposed to be involved in the work (e.g.

attention, reaction time, or memory). This was particularly the case in the selection for traffic jobs. In fact, it was a synthetic device for selecting tramdrivers with which Hugo Muensterberg ushered in the era of psychotechnics in 1912 (Muensterberg 1912)[4].

The synthetic paradigm found also a rapid dissemination in the Netherlands. Van Wayenburg, head of the Amsterdam municipal psychotechnical laboratory, equipped his testing station with a mock-up of the tramdriver's post, with all kinds of distracting and frightening signals mounted on both side-screens, to which the testee had to react as quickly as possible (van Went, 1926). Additionally a variety of psychological functions were measured in the line of the analytic paradigm, but not - as was the case in the Groningen laboratory -with classical laboratory apparatus but with especially devised psychotechnical apparatuses (category 2a).

The showpiece of "modern" psychotechnical testing, however, was the chauffeur's cabin of the psychotechnical laboratory of the Dutch Postal, Telegraphy and Telephone Company (PTT), a laboratory established in 1930 and headed by Dr. Rebecca Biegel. She installed a near-to-life mock-up of the driver's position, modelled after that of Lahy (1924, 1927), in which the testee, seated behind a real steering wheel, had to avoid obstacles projected on a film-screen (see Biegel & de Vries, 1935). It won accolades in the newspapers, and its fame spread over the whole country. Various other companies had their drivers tested by the PTT laboratory. Even His Royal Highness Prince Bernhard had himself tested by Biegel. Like the Amsterdam laboratory the PTT laboratory used also especially constructed analytic apparatus tests (category 2a) in addition to the synthetic cabin-device. A well-published example is the "Test for deliberate reaction", a contraption in which the testee was required to extinguish one just lighted candle out of a row of eight candles by squeezing one out of eight balloons connected to an intertwined network of small tubes (see Biegel & de Vries, 1932, 1935). In the selection of radio telegraphists she even contented herself with a "job sample test" with the help of a normal transmitter to which some measuring apparatus was attached[5]. The categories 3 and 4, to which I now proceed, were also represented, but category 2 was vital to the image both of the Amsterdam and of the PTT laboratory.

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[4] The French psychotechnician Jean-Maurice Lahy claims priority by having devised a synthetic device for testing employees in traffic jobs already in 1906 (Lahy, 1924).

[5] Biegel reported on her experiments at the VIth International Psychotechnical Conference, Barcelona. 1930 (published in the same year in the Revue de la Science de Travail, 2, 186, and later on in a more elaborate form in Biegel 1931).

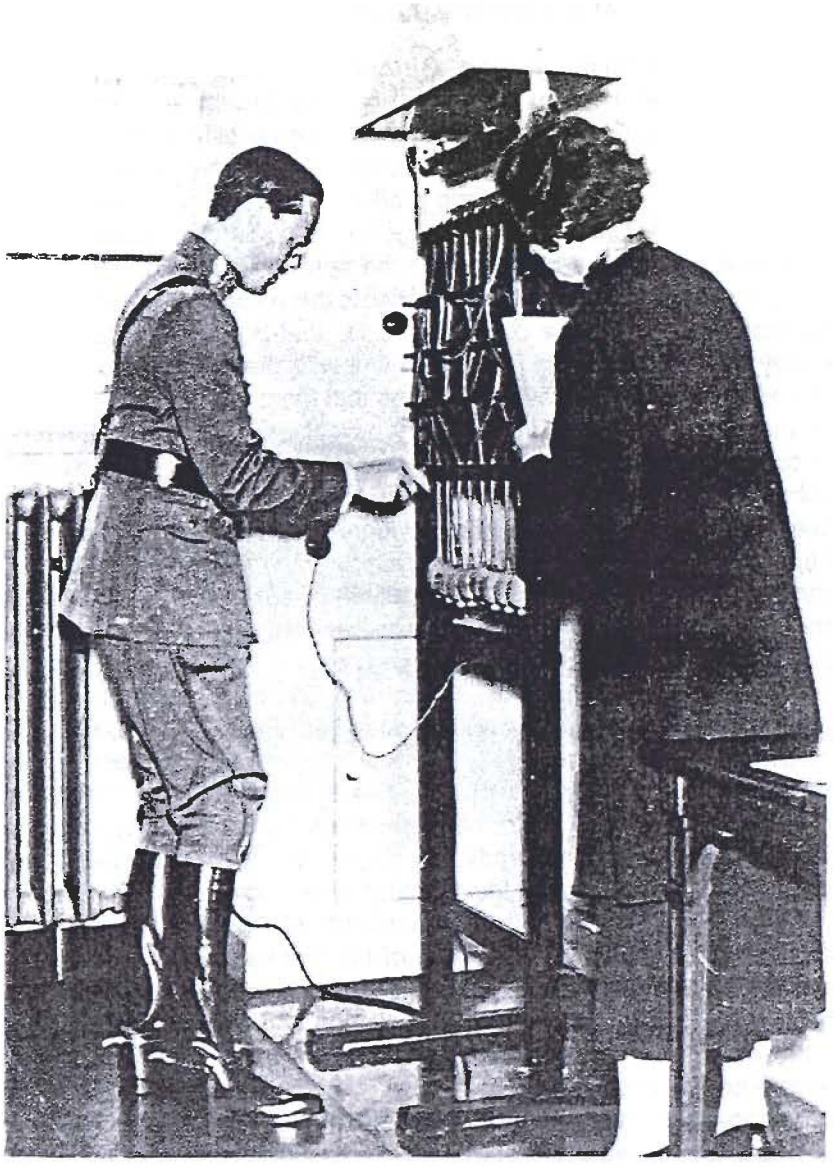

Figure 2.- His Royal Highness Prince Bernhard has himself tested with the "test for deliberate reaction"

## THE ZIELKUNDIG BEROEPSKANTOOR: EARLY PAPER-AND-PENCIL AND PERFORMANCE TESTS

Testing procedures at van Ginneken's Centraal Zielkundig Beroepskantoor at Utrecht (1918) were also indebted to classical elementaristic psychology, but in a way that radically differed from that of most other pioneering institutions. Van Ginneken, a versatile and widely-read Jesuit priest, who later became professor of linguistics at the newly established Catholic University at Nijmegen, was in search of methods that could, after a brief period of instruction, be applied by intelligent laymen. His Central laboratory was meant to become the nucleus of a network of testing stations all over the country, and for that purpose cumbersome laboratory apparatus was unsuitable. In line with the philosophy of early psychotechnics, his basic assumption was that fitness for a particular task was a matter of a mosaic of elementary psychological functions each of which could be measured with a simple test. As a self-made psychologist, not schooled in the laboratory tradition, he had no special commitment to the use of instruments, so - with the privilege of the outsider - he just took what appeared useful to him. After some eclectic search in the psychological literature he soon had disposal of a battery of no less than 120 tests, mainly of the paper-and-pencil or (simple) performance category. They were grouped in clusters, such as practical intellect, verbal talents, artistic abilities, spatial fantasy, and so on. Though van Ginneken had some notion that tests should meet some statistical standards, he didn't make much of it. Instead, he sought an easily manageably way of representing the results. Inspired by the psychological profiles of Rossolimo (1911) and the ingenograms of Laemmel (1922), he represented the outcomes of his tests in a circular diagram with 120 radii (Van Ginneken, 1925). To assess the fitness for a particular vocation this test profile was compared with a norm profile, based on previous tests on incumbents of the job in question. In practice he usually applied a selection of his test battery, depending on the type of vocations that were considered. Van Ginneken presented his method as the key both to vocational guidance and personnel selection.

In the other early laboratories easy-to-handle paper-and-pencil tests and simple performance tests (category 3) also slowly replaced the former wieldy apparatuses. In this respect developments in the diagnostic practice of the Bos-Institute described above gave expression to a general trend in the instrumentation of applied psychology. Prak, for instance, replaced the apparatus tests which the German psychologist Teuber, assistant to the Berlin pioneer Kurt Piorkowski, had introduced at the Philips laboratory in 1922 by paper-and-pencil and performance group tests when he took

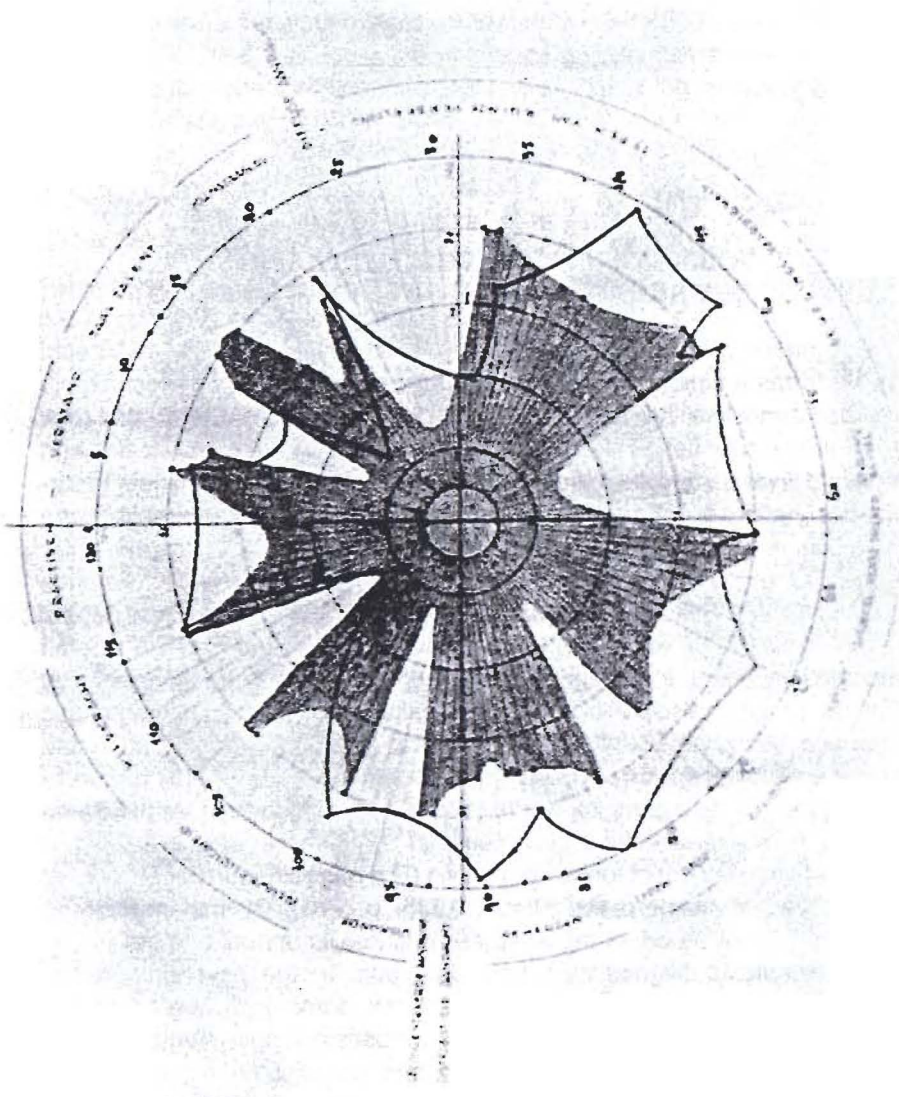

Figure 3.- Specimen of van Ginneken´s prifiles

over work in 1924. The time consuming Binet-scale and its derivatives was mainly confined to the "pedological" centres for the diagnosis and treatment of problem children that were established at the end of the twenties. In personnel selection, where time was money, there was a preference for group tests and simple performance tests that were used both for measuring and observational purposes. The outcomes were no longer handled in the "mosaic-like" fashion of van Ginneken but in a interpretative-qualitative way. This brings me to the fourth category.

## OBSERVATION AND PROJECTIVE TESTS: THE STICHTING VOOR PSYCHOTECHNIEK

Diagnostic practice at the Stichting voor Psychotechniek at Utrecht (1927) forms a typical illustration of the transition "from psychotechnics to psychodiagnostics" (van Strien & Haas, 1992; van Drunen, 1997) that took place in the twenties. This transition had started in Germany at the end of World War I. It was based on the shift from the established natur-wissenschaftliche approach in psychology to a geisteswissenschaftliche approach. As a consequence of the existential crisis evoked by the slaughter of the war, the conviction arose that the reduction of human performance to an interplay of elementary functions fails to penetrate into the real depths of human nature. In experimental psychology holistic methods like Gestalt became prominent. In vocational psychology some German pioneers, like Walther Moede (disciple of Wundt) remained true to the elementaristic approach, but others, like William Stern (who during the war still had tested female tramdrivers with psychotechnical methods (Stern 1918) began to see the person as a complex whole (Stern, 1921, Nachwort). At the Berlin Tagung fuer angewandte Psychologie in 1923 there was a call for a structural assessment of the whole person (Ruf nach struktureller Erfassung des ganzen Menschen, viz. Giese, 1925, p. 773). By the end of the twenties the role model of the engineer had lost its appeal and the model of the (medical) diagnostician took its place. In the psychodiagnostic approach that replaced psychotechnics the brass instruments of the laboratory tradition and the ingenious apparatuses and paraphernalia clever engineers and tinkering psychologists had constructed played only a subordinate role. Though apparatus tests continued to be applied, their primary objective was no longer to measure an ability, but to observe the way the testee arrived at a solution. No longer was the score at issue, but, as Walther Poppelreuter (1923, p. 78) put it, the person behind the apparatus.

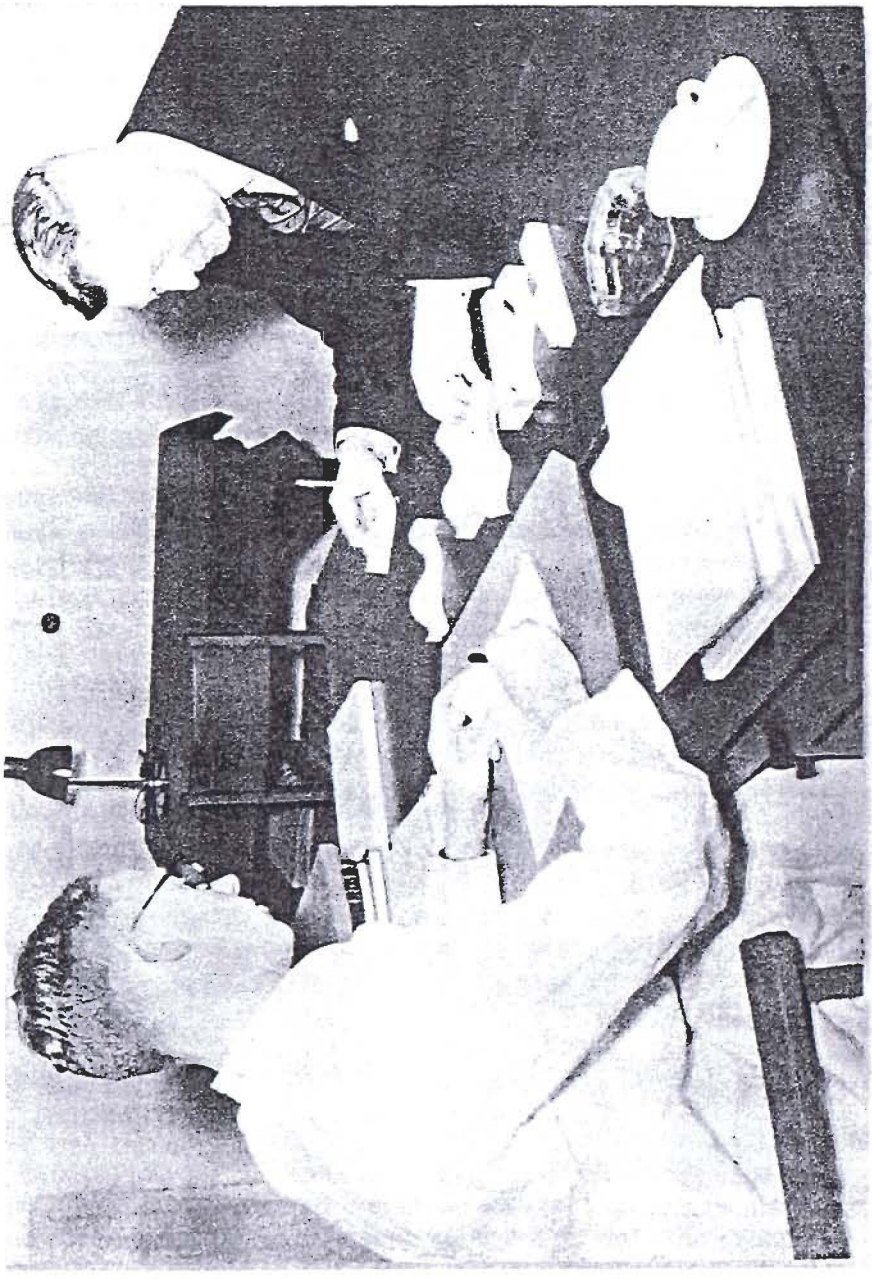

Figure 4.- Observing an applicant while reconstructing the Wiggly-block

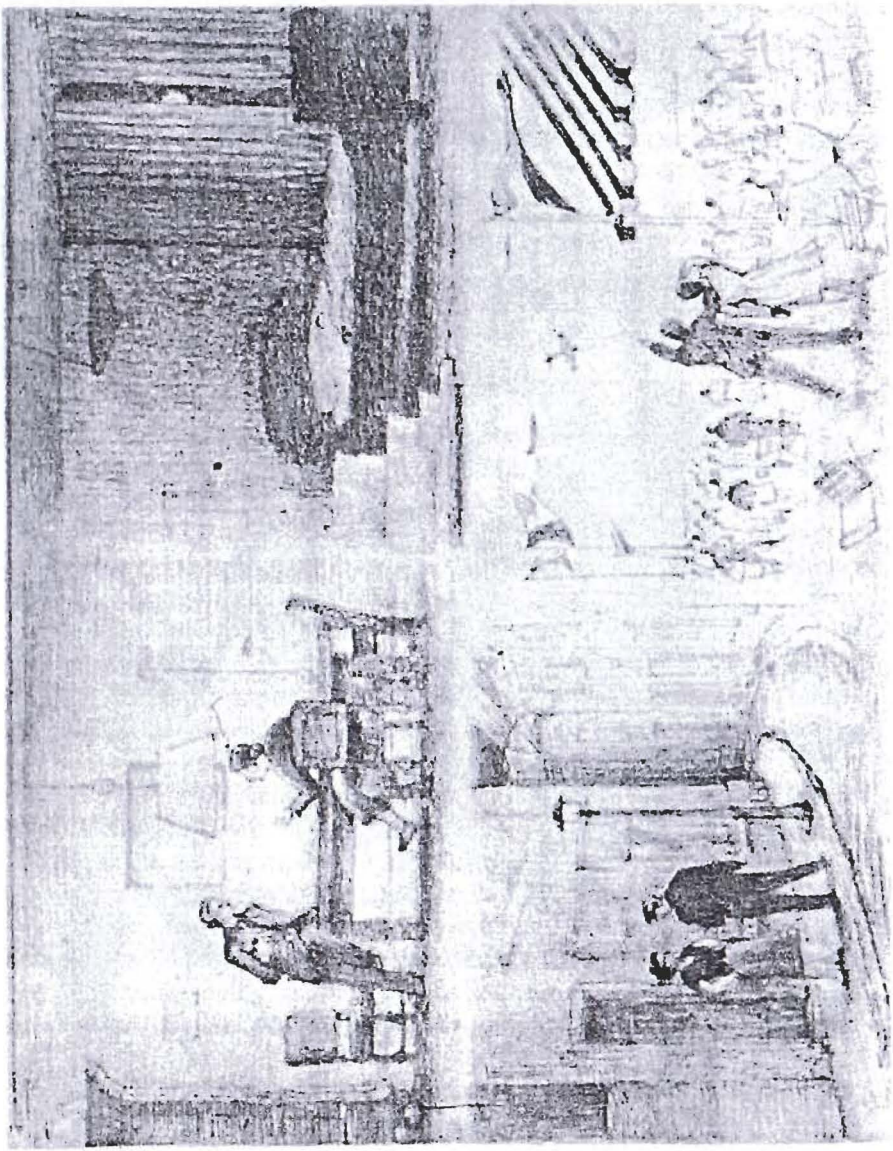

Figure 5.- Experimental version of van Lennep´s Four Picture Test

In the Netherlands the new anti-elementaristic diagnostic philosophy exerted a special appeal on the Protestant and Roman-Catholic segments of the population, because of the greater prominence it gave to the complexity of the person as a free and responsible being. But, in view of the higher professional status of the role of diagnostician compared to the old role of administrator of simple tests, it had also a more general appeal for practitioners who had earned the newly established doctorate in psychology.

David van Lennep, the spiritual head of the Nederlandse Stichting voor Psychotechniek, belonged to the first in the Netherlands to put the new diagnostic philosophy into practice. Psychotechnical apparatus tests, in the sense of category 3, were used by the Stichting to be sure, but mainly for the purpose of observing the reactions of the testee. Van Lennep, who had studied theology at Groningen, was the first to introduce the German and Swiss projection tests and diagnostics of expression in the Netherlands. He also made use of graphology and even of astrology. Inspired by a draft of the Swiss Rorschach disciple G. A. Roemer[6], he started to experiment with picture tests, and in 1930 this brought him to design his Vierplatentest (Four Picture Test), a projective device on which he wrote a dissertation later (van Lennep, 1947). A comparable diagnostic view prevailed at the Psychotechnical Laboratory of the Free University at Amsterdam (founded by Prof. Jan Waterink in the same year as the Utrecht Stichting).

The new diagnostic approach also led to a new, qualitative way of presenting the results. Whereas the outcomes of the former "measuring approach" could be represented in a simple diagram, a verbal report was now needed to convey the findings to the agency that had asked for advice, or to the client him or herself. Van Lennep, who was an amateur painter, spoke of "a portrayal in words", meant to convey the essence of the testee's capacities and personality (Van Lennep, 1949). Particularly in the selection of higher personnel – an increasing market - the managers involved were eager to go deeply into the personality of a candidate. Soon writing "deep" reports that appealed to insight into human character became a selling point in the competition between psychologists (Van Strien, 1964).

## THE DECLINE OF THE GEISTESWISSENSCHAFTLICHE APPROACH

In the course of the fifties the psychometric principles, which in American testing practice were already part of the standard conventions, began to gain ascendancy on the European continent as well. The geisteswis-

[6] See footnote to pag. 36 in van Lennep (1947).

senschaftliche approach and the implied esoteric, intuitive diagnostics were increasingly viewed with scepticism because of their unreliability and subjectivity. In this situation the tests of the third category, particularly the paper-and-pencil variety that could be administered in groups and could easily be validated against criteria of success, became the prevailing technique. Along with this objectivization psychological reports became more sober and pragmatic. This development was enhanced by the gradual replacement of the old, paternalistic generation of managers by modern, commonsense administrators who did not want to delve deeply into an employee's character, but, after the American example, only bothered about their effective performance. The movement for the protection of applicants' rights that spread from America to Europe in the course of the 1960s further drove back diagnostics in the style of the fourth category. Yet observing the testee's behaviour while performing some task, separately or in a group, continued to form part and parcel of some diagnostic techniques, particularly in the assessment centre style, a diagnostic approach that increasingly gained popularity in the Netherlands in the 1980s and 1990s. Following the development of testing practice in the last decades further is beyond the scope of this survey of the history of psychotechnics in the Netherlands. As far as the term psychotechnics is still used, it exists only as part of the name of some bureau's that were established in the heyday of apparatus testing in the Netherlands.

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