

cause the extreme portions of the imprint to be as clearly produced as the more central regions. Imprints of the thumb should be upward of 2.5 centimeters (0.98 inch), those of the three following fingers about 2.5, and those of the little finger 2 centimeters (0.79 inch) in width, in order to take impression of certain intersections that are indispensable for classification. The imprints corresponding to each of the fingers are designated by a number, answering to a certain type, ten of which are distinguished, and the combination of figures thus obtained, in conjunction with photographic portraits, will afford sufficient data to completely identify a person. Photographic portraits, however, of the individuals themselves, are also of the highest importance.

The apparatus used in the Italian police service and at the academy was invented by Umberto Ellero, manager of the photographic police department, and allows two views, *en face* and in profile respectively, to be simultaneously taken. The apparatus comprises two cameras with fixed focus, any motion imparted to one of them being transmitted to the other camera, so that the individual is photographed simultaneously from the front and the side. This secures the advantage of higher speed and of less resistance on the part of the criminal, in addition to a perfect agreement in the expression of each of the two views. The police academy further possesses an apparatus, by means of which a photograph can be taken unseen from one room to another.

As photography is used most extensively in the search for a criminal (views taken on the spot, microphotographic records of blood traces, etc.) this art is receiving much attention at the school.

The Bertillon system of anthropometric measuring is also taught at the school. Though this method is somewhat lengthy, it in many cases affords the most valuable complement to ordinary data.

The results of modern psychology are likewise utilized, such characteristics as the motility, gait, handwriting, general sensitiveness and sensitiveness to pain of a person being used for his identification. Data relating to the intelligence, volition, temperament, feelings and character of the subject are also of the utmost importance. Recent experiments, according to which the associations most characteristic of a person can be utilized as an aid in ascertaining his guilt, strikingly illustrate the unexpected possibilities of psychology in that field.

Data relating to the functions of the most important organs are likewise useful, as inferred from the fact recently established by Prof. Einthoven, that the heart curves of a man of themselves suffice to characterize the person and fix his identity. Other data, the utilization of which is taught at the Roman academy, comprise the biography of an individual, his heredity, behavior at home and in business, his taste or dislike for work, past illnesses, or crimes committed.

Another study is the classification of the dangerous social sets from a scientific point of view (such as the difference between insane and non-insane criminals, established by Lombroso), or from a more practical standpoint, according to the characteristics of criminals and their crimes.

The relation of the dangerous classes of society to public safety is an important subject. Punishment can hardly be considered as a means of correcting the criminals, nor owing to the largely maladaptive disposition of the latter, is it a well-deserved expiation of personal guilt, so that we are forced in the majority of cases to regard punishment merely as an act of self-defense on the part of society against those that endanger its safety. It is therefore of the highest importance, in fixing the penalty, to take into account not only the crime but the personality of the convict and his conduct and degree of dangerousness.

In the case of crimes against life, intelligent investigation into the cause of death and its circumstances is obviously indispensable. The police officers should therefore have some scientific knowledge of the causes of death, and be in a position to utilize any blood stains or weapons found on the spot as useful evidence. In the search for the criminal a distinction should be made, according as he is known or unknown, or else has left any traces. The procedure of criminal officers in these various cases is taught both theoretically and practically. Of much importance, therefore, is the management and internal arrangement of public safety offices, comprising the archives, with their biographical files, local topography, calendars of criminality, and books on criminal geography.

The instruction imparted at the school comprises daily practical exercises, theoretical and practical lectures delivered three times per week, according to the above programme, and daily demonstrations.

As in medical clinics, demonstration on the individual is the basis of instruction at this police school. The police officer derives his knowledge from the inspection of criminals, and in this connection the Roman police academy may be considered unique in the world. In addition to the exhibition of culprits, photographic records, corpses, tangible evidences of crime, and handwriting and other productions of the criminal, are used as means of instruction.

What skill may be acquired after some training in the identification of persons is inferred from the fact that the pupils after a short time's practice can select from hundreds of photographs any one characterized by means of some salient data. Instruction in prac-

tillon data, and finally, these are supplemented with particulars of the character and biography of the individual.

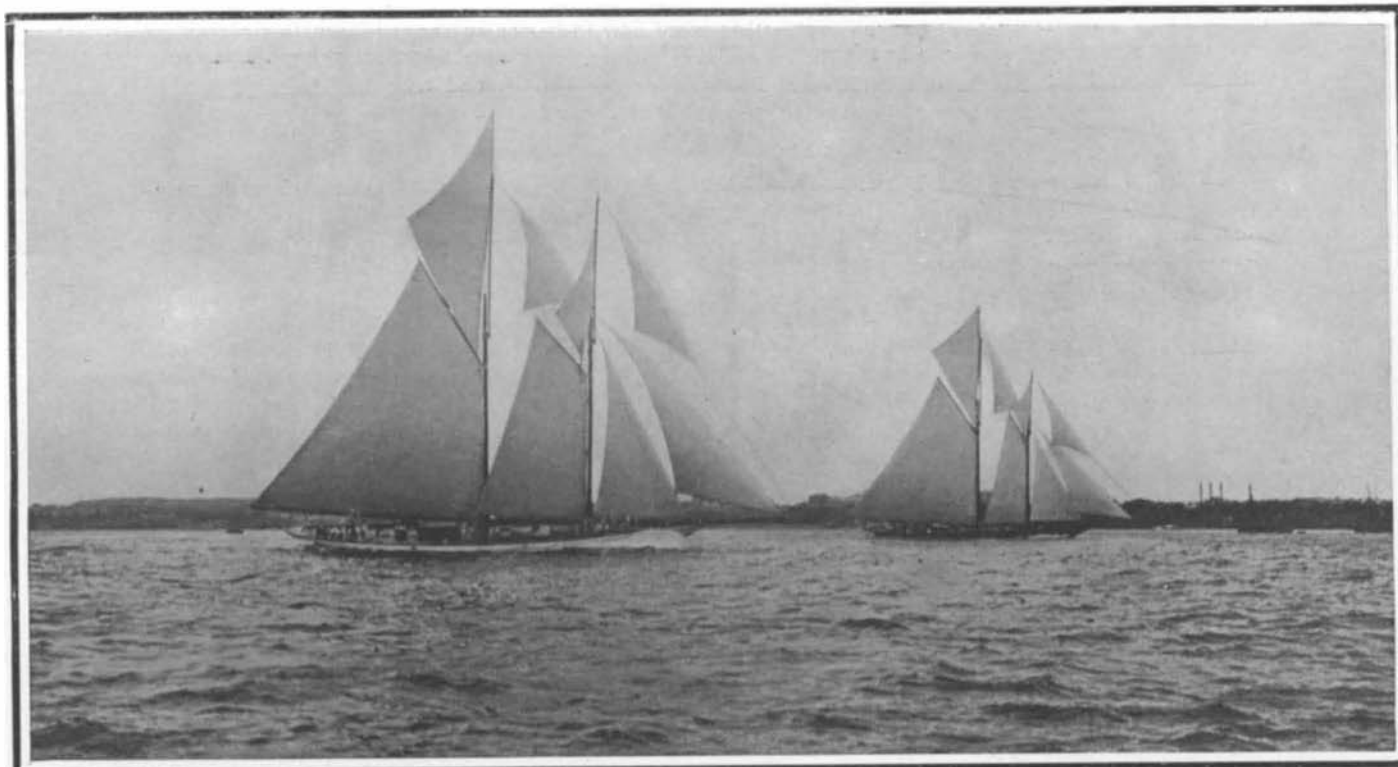
THE NEW GERMAN RACING SCHOONER "GERMANIA."

The recent brilliant victories of the German-designed and constructed schooner yacht "Germania" in British waters was one of the most significant facts that have occurred of recent years in the yachting world; for it places the German yacht designers in the very front rank of the naval architects of the world.

The entrance of Germany into the sport of yachting is of comparatively recent date; and it is due mainly to the efforts of that all-round sportsman Kaiser Wilhelm II; for during the decade and a half in which the Germans have begun to figure in this the noblest of all sports, they have been content, at least in the class of large ships, to purchase their yachts from foreign owners or place their orders with foreign yards. The German Emperor's cutter yacht "Meteor" was designed by Watson, and his present "Meteor" by A. Cary Smith. The fine fleet of schooner yachts, which forms the most notable portion of the German fleet, is composed mainly of American- or English-built yachts. The efforts of the German naval designers have hitherto been confined mainly to boats of the smaller classes; and the notable successes in little fellows of the "Sonderklasse" type, two or three years ago, were indicative of the good work the Germans would probably do, if they ever turned their attention to the larger boats.

For this season's racing, Krupp von Bohlen Halbach, of the Kieler Yacht Club, placed an order with the

naval architect Max Oertz for a large keel schooner, which was built by Krupp at the Germania yards. The dimensions of the yacht are: Length over all, 155 feet; waterline length, 108 feet; beam, 27 feet; and total sail area, 14,135 square feet. The "Germania" is built of steel, and in the course of the racing in the Solent this year, she proved herself to be the fastest racing two-masted schooner at present afloat. In the match for the Kaiser's cup she sailed the old Queen's course of 47



Length Over All, 155 Feet. Waterline Length, 108 Feet. Beam, 27 Feet. Sail Area, 14,135 Square Feet.

The "Germania" is the first large racing schooner yacht to be designed and built in Germany. She has proved to be the fastest schooner in the present British racing season.

THE NEW SCHOONER "GERMANIA" RACING AGAINST "HAMBURG" IN THE BALTIC.

tical criminal psychology is mainly based upon the memoirs of prominent criminalists, and the cross-examination of all kinds of criminals.

With the school is connected a laboratory, in which not only a complete apparatus for the Bertillon measuring method, but all kinds of instruments for the investigation of organic and psychic functions are found. Instruments for gaging the working of the senses and recording any unconscious motion are likewise contained in this laboratory in addition to the handwriting and similar productions of criminals, as well as any documents liable to give an insight into their minds. Photographic apparatus of precision for the recording of handwriting and figures, as well as for taking views of the scene of the crime, and microscopes for the investigation of traces and imprints are other valuable aids to instruction.

The scientific training of officers, carried out for some time, has obviously revolutionized the whole of the Italian police service. In the place of the identifying cards filled out with more or less indefinite data, which were formerly used, cards are now used containing detailed information, which perfectly suffices to insure the identification of any individual. The two sides of such a card are herewith illustrated comprising on the front side the double portrait of the man, as obtained by the Ellero apparatus, and the five finger imprints of the left hand, while those of the right hand are recorded on the back. On the latter will be found also a special section reserved for the signature of the criminal, which, however, has not been filled in in the present case, the man pretending to be unable to write. Above this section are the Ber-

miles in 3 hours, 35 minutes, and 11 seconds, at an average speed of 13.1 knots. Commenting on her performance, the English yachting journal *The Yachtsman* said: "We have no schooner in England which can compare with the 'Germania' for speed, and if report is true, we shall be left further in the lurch by our German friends next year." This report is to the effect that the German Emperor is so pleased with the performance of "Germania," that it is his intention to order a large schooner from the same designer for next season's racing.

The first races of "Germania" were sailed on the Baltic, where she decisively defeated both "Meteor" and "Hamburg." "Hamburg" is the large Watson-designed schooner, now owned in Germany, which won second place in the ocean race a few years ago from Sandy Hook to Land's End. The accompanying photograph, for which we are indebted to Major A. E. Piorkowski of the German Imperial Army, was taken during the course of one of these races.

At the Heroult electric iron smelter on the Pitt River in Shasta County, California, a number of new types of electric furnaces are being tested on a small scale, instead of working with one large furnace alone, as has been heretofore the plan. A bank of transformers will be ready by the time the new Lyon furnace under construction is completed. The new furnace, of a capacity of 25 tons of pig iron per day, is on the same plan as the original experimental one. It is claimed that it will remove the objections found to the Heroult furnaces first erected.