

Pension (1897) D-1
Government (1897) of Madras.
JUDICIAL.

Current No 878



Recd. *29/10/.* } 1897.
Regd. *29/10/-* }

Enclosures —
Spare copies 1

G.O., No. 1472, 9th October 1897.

OCTOBER.

Identification by finger impressions.

Communicating to the Hon'ble the Judges of the High Court and to certain heads of departments letter from the Government of India forwarding copy of report on the working of the anthropometric system for the identification of old offenders and on the progress made in elaborating a system of classifying finger impressions in the Lower Provinces of Bengal; as also one from the Committee appointed to inquire into the system of — with an expression of opinion on the advisability of adopting the latter system all through British India.

List

Order, 1st Nov 1897 No 937

Recorded.

11/11/97

11/11/97

GOVERNMENT OF MADRAS.

JUDICIAL DEPARTMENT.

READ—the following papers:—

From J. P. HEWETT, Esq., C.I.E., Secretary to the Government of India, Home Department (Police), to the Chief Secretary to the Government of Madras, dated Simla, 12th June 1897, No. 328.

In continuation of the endorsement from this department, No. 3—447, dated the 20th August 1896, I am directed to forward a copy of a letter* from the Government of Bengal, submitting a report from the Inspector-General of Police,

* No. 1673-J., dated the 20th March 1897, and enclosure.

Lower Provinces, on the subject of the working in Bengal during 1896 of the anthropometric system for the identification of old offenders and on the progress that has been made in elaborating a system of classifying finger impressions. I am also to forward a copy of a report by a Committee appointed to inquire into the latter system, and to say that, in view of the favourable opinion expressed by the Members† of the Committee, the Governor-General in Council is of opinion that the system of identification by finger impressions should be adopted generally in British India.

† Major-General C. Strahan, R.E., Surveyor-General of India.

A. Pedler, Esq., F.R.S., Principal, Presidency College, Calcutta.

that the system of identification by finger impressions should be adopted generally in British India.

ENCLOSURES.

From C. W. BOLTON, Esq., Chief Secretary to the Government of Bengal, to the Secretary to the Government of India, Home Department, dated Calcutta, 20th March 1897, No. 1673-J.

In continuation of the letter from this office, No. 4-J.T., dated the 13th July 1896, I am directed to submit, for the information of the Government of India, a copy of a report from the Inspector-General of Police, Lower Provinces, on the subject of the working in Bengal, during 1896, of the anthropometric system for the identification of old offenders, and on the progress that has been made in elaborating a system of classifying finger impressions with a view to substituting this means of identification for anthropometry.

2. I am to enquire, with reference to paragraph VI of the report, whether the Government of India would be willing to appoint a Committee, as suggested by the Inspector-General of Police, to enquire into and report upon the system.

From E. R. HENRY, Esq., C.S., Inspector-General of Police, Lower Provinces, to the Chief Secretary to the Government of Bengal, dated Calcutta, 13th March 1897, No. 2471.

In continuation of previous reports (the numbers and dates of which are given in the margin), I have the honour to submit information regarding the working in this Province, during 1896, of the anthropometric system, and also regarding the progress made in elaborating a system of classifying impressions with a view to substituting identification by finger prints for anthropometry.

Letter No. 25229 of 22nd December 1891; No. 1732 of 25th February 1893; No. 6553 of 1st May 1894; No. 10562-A of 26th June 1895; and No. 10566-T of 24th June 1896, from the Inspector-General of Police, Lower Provinces, to the Chief Secretary to the Government of Bengal.

margin), I have the honour to submit information regarding the working in this Province, during 1896, of the anthropometric system, and also regarding the progress made in elaborating a system of classifying impressions with a view to substituting identification by finger prints for anthropometry.

II. During the year, 2,101 persons were on arrest, treated as unidentified. By sustained enquiry, the local police succeeded subsequently in recognising 1,270 of them, leaving a balance of 831 persons unidentified, with whom anthropometry had to deal.

The following table, which gives statistics for three years, shows that the success achieved has been progressive, and that the figures compare favourably with those submitted for Provincial France by Mons. A. Bertillon, to the Fourth International Congress of Criminal Anthropology held at Geneva in August 1896:—

Year.	Total number of cases in which identity established by anthropometry.	Number in column 2 referred by Bengal districts.	Total number of persons in Bengal districts whose identity local police failed to ascertain.	Percentage of success from Bengal districts (column 4 to column 3).	Percentage of success, with females, juveniles, and non-British subjects excluded from total of column 4.	Number of cases identified by the Paris Bureau on reference from French Provinces.	Remarks.
1	2	3	4	5	6	7	8
1894	143	112	536	21	27	133	
1895	207	162	641	25	31.6	151	
1896	334	252	831	28	42.3	..	

The figures in column 2 for 1896 include 69 cases identified for the Calcutta police, 27 for Assam, 1 for Burma, and 1 for the North-Western Provinces.

The figures of column 6 are arrived at by deducting females and juveniles who are not liable to measurement, and non-British subjects belonging to States where anthropometry has not been introduced, from the totals of column 4 for the purpose of calculating the percentage. In 1896, there were 14 females, 53 juveniles, and 103 non-British subjects.

III. These statistics may be relied upon, as much care is taken at the Central Office to guard against bogus identifications. In three cases—one from Mymensingh and two from Nadia—references were made to the Central Office regarding men actually residents of these districts, the explanation offered being that, although the identity of the suspects was known, it was thought, as they were of wandering habits, that they might have been convicted in distant places, information not having been sent to their native districts. Of the 334 persons identified, 109 were ascertained to have given correct names and addresses. As pointed out last year, such information, until tested, is of no value, as criminals, to defeat enquiries, occasionally give the names and addresses of persons other than themselves. This information might have been verified by calling witnesses, a tedious and expensive process, which was rendered unnecessary by the testimony afforded by the anthropometric data. When the cases came to trial, the evidence required by law as to the fact of previous criminality and identity had of course to be produced by the local Police, who, from the information supplied by the Central office, knew where to seek for it.

IV. This outturn justifies the opinion that the anthropometric system is being worked on sound lines and effectively, since, by means of it, four out of every possible ten cases were identified, some of the identifications being from areas not in any way under the departmental control of the Bengal Police office, as Assam, the North-Western Provinces, Burma, the Calcutta Police.

V. Satisfactory as are these results, longer experience has convinced me that it is possible to substitute, with gain of power and saving of expense, labour and time, a system of identification by finger impressions only, not supplemented by measurements. The difficulties experienced during the last two years in devising an effective system of classifying have at length been overcome. A statement in parallel columns of the strong and weak points of either system will illustrate the advantages claimed.

Anthropometry.

1st.—Instruments are costly, liable to get out of order, and not easily replaced.

2nd.—Measurers have to be put through a somewhat lengthy course of instruction and must be possessed of sufficient education to understand the significance of the figures of the decimal scale.

3rd.—The "Personal Equation" error, due to negligence or want of skill on the part of the measurer in taking, reading or transcribing figured results, must always remain a probable source of failure.

Identification by finger prints.

1st.—Accessories needed, a piece of tin and some printer's ink, are inexpensive and procurable everywhere.

2nd.—Any person, whether educated or not, after half an hour's practice, can take legible finger impressions.

3rd.—As impressions are self-signatures free from all possible errors of observation and transcription, the "Personal Equation" error may be wholly left out of account.

Anthropometry.

4th.—Recording measurements occupies much time, as each measurement is taken three several times and the mean only accepted. Marks and scars are noted, and this necessitates the body being exposed. High caste measurers express repugnance at having to touch the feet of low caste men, and the persons measured object to the uncomfortable positions into which they are forced.

5th.—Search in the almirahs is particularly onerous, because allowance must be made for the "Personal Equation" error. For instance, when a card with length of head 18.4 is received, it is necessary to assume that the measurer may have gone wrong within 2 millimetres either in excess or defect, and search accordingly is made between 18.6 and 18.2, but the former comes under limit "Long" and the latter under limit "Medium"; i.e., different pigeon-holes have to be examined. Similar allowance has to be made in respect of the other five measurements, with the result that on an average nine pigeon-holes must be searched, the process, now that our criminal record consists of about 30,000 cards, occupying over one hour.

6th.—The strongest feature is the excellence of the system of primary classification, whereby roll-cards are distributed amongst 729 pigeon-holes. In this country, owing to there being little variation in the pigmentation of the iris of the eye, or in the colour of the hair, secondary classification upon the data we possess presents many difficulties.

7th.—It has been claimed that the probability of all six measurements of two different persons agreeing is so small, that a fraction with a denominator of five figures would be required to express it arithmetically. The assertion would be correct if no allowance had to be made for the "Personal Equation" error, but in practice such allowance (i.e., from 4 to 6 millimetres) is and must be made, and, as coincidences in measurement have occurred, no positive deductions from measurements as to identity can be deemed safe.

VI. We have already classified over 8,000 sets of finger impressions with about 600 duplicates, so the materials for subjecting the system to severe tests are ample. If it answers these tests, there will remain no room for doubt that identification by finger impressions must, owing to its inherent advantages, supersede anthropometry everywhere in this country, and also in ask that the Government of India be moved to appoint a small independent Committee to inquire into and report upon the system. Since the beginning of the present year, anthropometric data are no longer taken for permanent record in Bengal. Unidentified persons are being measured as before, so that the existing anthropometric criminal record may be utilised, but the finger impressions only, and not the measurements of new convicts, are being taken.

Identification by finger prints.

4th.—The impressions of the ten digits can be taken in one quarter of the time needed for measuring. No record of marks and scars is needed, consequently the subject has not to divest himself of his clothes. High caste men do not object to taking finger impressions; even *purdanish* ladies now give a thumb impression when admitting before a Registrar the execution of deeds.

5th.—Search is comparatively rapid. By the aid of rigid definitions transitional cases have been wholly eliminated, and search consequently has to be made under one classification number only, and not under several. With criminal records of similar volume, search amongst finger impressions would be manifold more rapid and, according to my experience, more certain.

6th.—An arrangement similar in principle to the Bertillon system, only more exhaustive, has been devised, whereby finger impressions are, in primary classification, rapidly subdivided amongst 1,024 pigeon-holes, and wherever there is accumulation, effective means of secondary classification have been worked out.

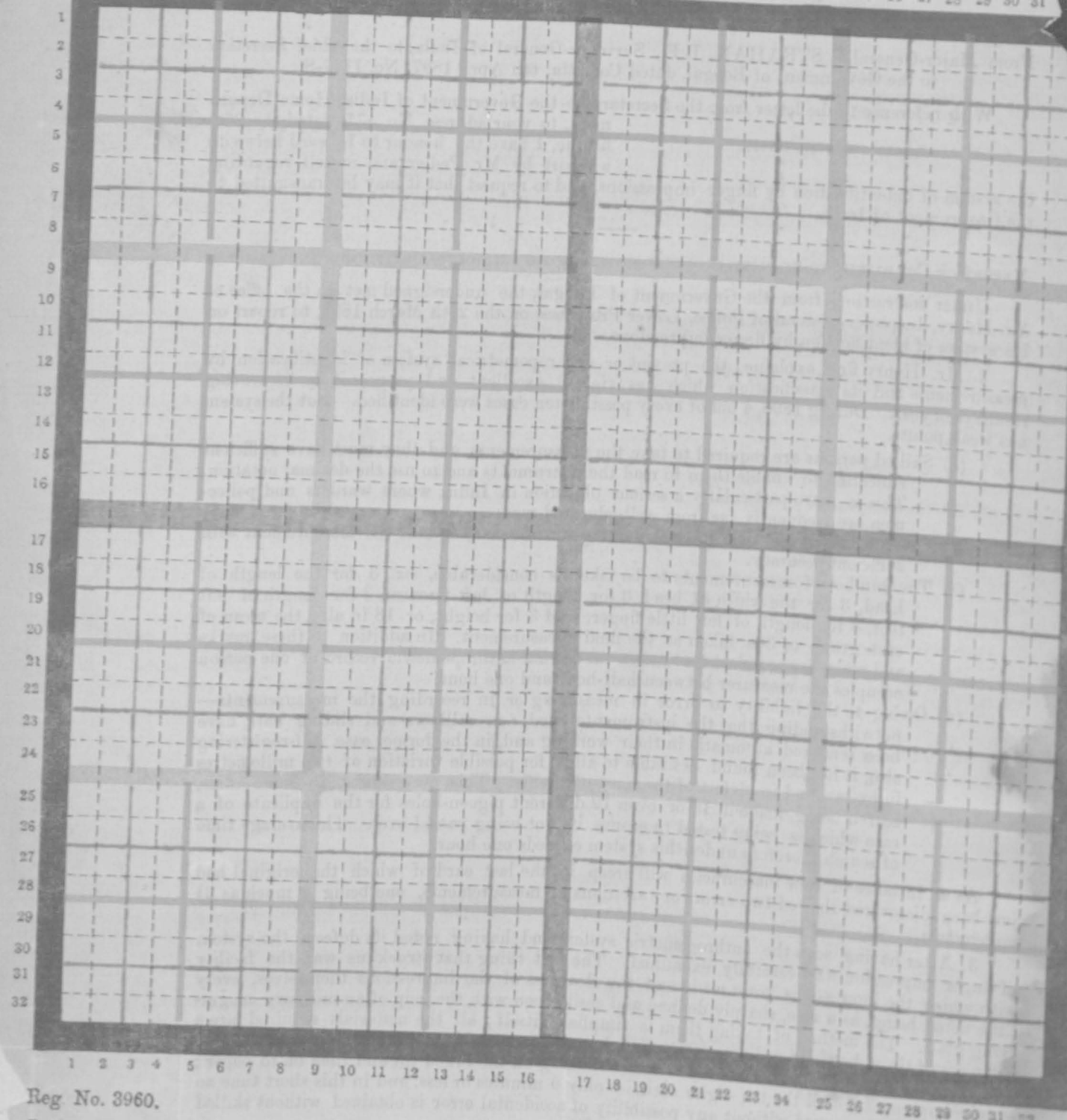
7th.—Each of the ten impressions taken has its own individual "minute peculiarities," which can be observed and described. If, for purposes of establishing identity, a couple of minute peculiarities in each impression on a card under search are selected, sought for, and found in a duplicate, the probability that the impressions on the card under search, and on the duplicate, are those of the same person, is of a higher degree than that which, to most minds, ordinarily represents certainty.

From C. W. BOLTON, Esq., Chief Secretary to the Government of Bengal, to the Secretary to the Government of India, Home Department, dated Darjeeling, 19th April 1897, No. 2-J.D.

In reference to the correspondence ending with your letter, No. 177, dated the 26th March 1897, I am directed to submit to the Government of India the accompanying copy of a letter, No. 1127-S., dated the 6th April 1897, from Major-General C. Strahan, R.E., Surveyor-General of India, and of its enclosed report of the Committee appointed to examine into the system of identification by finger impressions.

CLASSIFICATION BUREAU.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



Reg No. 3960.
Copies. 158

Litho, Survey Office, Madras.
1897.

EXPLANATION.

The impressions of the ten digits are taken in pairs in the following order:—
(1) Right Thumb and Right Index; (2) Right Middle and Right Ring; (3) Right Little and Left Thumb; (4) Left Index and Left Middle; (5) Left Ring and Left Little. All impressions are held to be divisible into 2 types, Loops (which include Arches) and Whorls. Given ten impressions in the above order, they can be expressed by some such formula as the following:— $LWLLWLWWLW$ where L =Loop; W =Whorl. The Key indicates the one pigeon-hole out of the 1024 of the Bureau where a card with the above formula will be found. Referring to the Key, LW is in top right hand square, therefore we proceed to square defined by the broad black and blue lines, and by the horizontal numbers 17 to 22 and vertical 1 to 16. Taking the next pair WL we see from the Key that it is in bottom left square of $\frac{17-22}{1-16}$, i.e., in the square defined by red and blue lines and by horizontal figures 17—24 and vertical 9—16. The next pair LL is in left top corner of this $\frac{17-22}{1-16}$ square, i.e., in the square defined by one red, one blue, and two yellow lines, and by horizontal figures 17—20 and vertical 9—12. The next pair WW is in right hand bottom corner of this $\frac{17-22}{1-16}$ square, i.e., in square marked by two green and two yellow lines and by horizontal figures 19—20 and vertical 11—12. Finally, the last pair LW is in top right hand corner of this $\frac{17-22}{1-16}$ square, i.e., in pigeon-hole $\frac{17-22}{1-16}$. Any other combination of impressions can be similarly located.

Key.

LL	LW
WL	WW

No. 1472, JUDICIAL, 9TH OCTOBER 1897.

5

From Major-General C. STRAHAN, R.E., Surveyor-General of India, to the Chief Secretary to the Government of Bengal, dated Calcutta, 6th April 1897, No. 1127-S.

With reference to the letter from the Secretary to the Government of India, Home Department, to your address, No. 177, dated the 26th ultimo, I have the honour to forward herewith a report by Mr. Pedler and myself regarding the system of identification by finger impressions, and to request that it may be transmitted to the Government of India.

Dated the 21st March 1897.

REPORT OF COMMITTEE TO EXAMINE INTO THE SYSTEM OF IDENTIFICATION BY FINGER IMPRESSIONS.

Under instructions from the Government of Bengal, the undersigned met in the office of Mr. Henry, Inspector-General of Police, Lower Provinces, on the 29th March 1897, to report on his system of identification by finger impressions.

2. Mr. Henry first explained the present or anthropometrical system of identification by measurements and its classification which has yielded excellent and progressively improving results each year. During 1896, 4 out of every possible ten cases were identified. But the system has weak points.

- Skilled persons are required to take the measurements, and they must have sufficient education to enable them to read the instruments and to use the decimal notation. This is more particularly a serious objection in India, where warders and police-men are frequently far from well-educated men.
- Carefully made and delicate instruments are necessary to take the measurement with sufficient accuracy.
- The number of measurements to be taken is considerable, viz., 3 for the length of head, 3 for the width of head, 3 for length of left forearm, 3 for length of left foot, 3 for length of left little finger, and 3 for height, or 18 in all; the mean of each group of 3 is taken as the final measurement. In addition to these, marks and scars are searched for and so the actual anthropometric record of one person occupies the measurer between half-hour and one hour.
- Owing to the liability to error in measuring or in recording the measurements— notwithstanding that the instruments used, i.e., callipers and sliding bars, have been rendered automatic in their working and, in the former case, self-registering also, it has been found desirable to allow for possible variation of two millimetres in excess and in defect of the measurements. This necessitates, in some cases, a search being made in 10 or even 12 different pigeon-holes for the duplicate of a case which is being tested to ensure its not being passed over. The average time of search therefore under this system exceeds one hour.

As an instance of how inaccuracies will creep in, the last card of which the original had just been discovered showed two errors or variations in measurements, one being as much as 3 millimetres.

3. After having seen the anthropometric system and having noted its defects, the system of finger impression was carefully examined. The first thing that struck us was the facility with which the impressions were made and the clearness of the impressions themselves, every little detail being, as a rule, sharply defined and easily seen with the help of an ordinary magnifying glass. The method of taking them is simplicity itself; all the materials required are a flat piece of tin, a bottle of ordinary printer's ink and a small rubber roller to spread the ink on the tin. The finger is rolled carefully without rubbing on the inked tin and then on to paper; to take impressions of all the ten digits occupies only 5 minutes or less, and in this short time an absolutely accurate record without any possibility of accidental error is obtained without skilled labour and without instruments.

4. The method of classification devised by Mr. Henry was then explained to us. The first classification divides all the different kinds of impressions into two classes only, which can be recognised at a glance; by taking the combinations of these two classes as exhibited in the ten different digits, taken in pairs, all descriptive cards can be divided into 1,024 classes, and to each class is allotted a separate pigeon-hole. By means of the key, a copy of which is attached, any one pigeon-hole can be at once found with the greatest ease and certainty even by a person who has never seen the system before. We were both enabled to do this at once without any difficulty. Having thus located the card in one particular pigeon-hole, a further classification is necessary to assist in the search through all the different cards in that pigeon-hole; this further classification depends on the details in the impressions, which it is unnecessary to enter into here; but it is so simple that we were both able to find the originals of two of the most intricate cards that could be produced, with ease and certainty. The men whose duty it is to look up for the originals in no case took more than 5 minutes to produce the original, the duplicate of which we had handed to them out of a file of some 600 records, and the originals of which were part of a file of finger print cards exceeding eight thousand in number. One case which was selected as being apparently an especially difficult one, as it was very indistinct, was found in two minutes.

only. The principles of the sub-classification are such that should minute distribution be needed in consequence of any great accumulation in any one pigeon-hole, it can easily be made by extending the same principles. The system of search is therefore much more rapid and more certain than that for the anthropometric data.

5. The greatest sceptic would be at once convinced of identity, on being shown the original and duplicate impressions. The exact repetition of most minute details is quite astonishing. There is no possible margin of error and there are no doubtful cases.

6. Thus the three main conditions laid down by the Committee appointed by the Secretary of State to enquire into the best means available for identifying habitual criminals are fully satisfied, viz. :—

- (1) The descriptions, measurements, or marks which are the basis of the system must be such as can be taken readily and with sufficient accuracy by prison warders or police officers of ordinary intelligence.
- (2) The classification of the descriptions must be such that on the arrest of an old offender who gives a false name his record may be found readily and with certainty.
- (3) When the case has been found among the classified descriptions it is desirable that convincing evidence of identity should be afforded. In that same report it is acknowledged that Mr. Galton's finger print method completely met the first and third conditions, but they disapproved of his method of classification. Mr. Henry's method of classification and sub-classification has, we consider, effectually got over the objections raised by them, for, out of 8,000 cards, no sub-class contained more than from 10 to 20 originals, and the system is capable of almost endless amplification if necessary.

7. In conclusion, therefore, we are of opinion that the method of identification of habitual criminals by means of finger prints as worked on the system of recording impressions and of classification devised by Mr. Henry may be safely adopted as being superior to the anthropometric method, (1) in simplicity of working, (2) in the cost of apparatus, (3) in the fact that all the skilled work required is transferred to the central classification Bureau, (4) in the rapidity with which the process can be worked, and (5) in the certainty of the results.

CALCUTTA,
31st March 1897.

(Signed) CHAS. STRAHAN, Major-General, R.E.,
Surveyor-General.

(Signed) ALEX. PEDLER, F.R.S.,
Principal, Presidency College.

From the Government of India, dated 23rd July 1897, No. 428.

ORDER—No. 1472, Judicial, dated 9th October 1897.

The foregoing letter from the Government of India, with its enclosures, will be communicated to the Hon'ble the Judges of the High Court, to all departments of the Secretariat, and to the Inspectors-General of Police, Prisons and Registration.

(True Extract.)

Admiral
for Chief Secretary.

To all Departments of the Secretariat. (*Pension*)
" the Hon'ble the Chief Justice (with C.L.).
" the Inspector-General of Police.
" the Inspector-General of Prisons.
" the Inspector-General of Registration.