

under Seal." If it has passed muster, you will receive it there and then : but if it is not ready, the official will direct you to a certain room, and you must now make up your mind that there is a *hitch* or hitches somewhere. These hitches having been removed to the satisfaction of the officials, you will call at the "Sealer's" again in a day or so, and then you will find the Probate duly sealed.

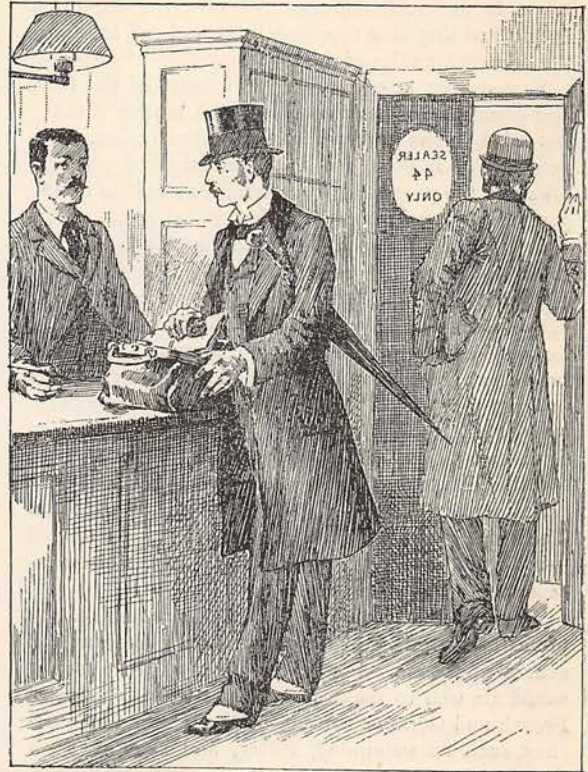
It is not often nowadays that one hears of a will made by two persons, and the following is a curious one which was proved some years ago by the writer of this article. It is an exact copy of the will, the names only being changed :—

IN THE NAME OF GOD AMEN.

We John Smith and Robert Smith Brothers and Partners in Business Living in the Parish of — in The County of Somerset and knowing that it is appointed for All men once to Die do make and Ordain this our last will and Testament that is to say Principally and first of all we give and Recommend our souls into the Hand of Almighty God that gave it And our Bodys we commend to The Earth to be Buried in Decent Christian Burial at the Description of Our Executor and as tuching Such worldly estate wherewith it Hath pleased God to bless us We give and dispose of the same in the following manner We give and Bequeath to Our Nephew Thomas Jones Whom we likewise constitute make and Ordain the Sole Executor of this Our last Will and Testament The Dwelling House and Mill and all other Buildings and Garden belonging Thereto and all Our Household Goods and Effects and all that We shall Possess at our Demise and the said Thomas Jones Shall Pay off all Our Just Debts if any

In Witness whereof we Have Hereunto set Our Hands And Seal this Eighteenth day of February in year of Our Lord one Thousand Eight Hundred and Seventy

Signed sealed Published
Pronounced and Declared the mark of John Smith ×
By the Said John Smith
and Robert Smith as their
last Will and Testament
in the Presence of us and



SEALING FOR PROBATE.

of each other who have
Hereunto Subscribed our
Names JOHN BROWN
JOHN JONES

Robert Smith Seal.

With reference to this will, I may here add that it is quite unnecessary to seal a will.

The limits of this article are necessarily short, and it is impossible to provide for every contingency that may arise ; but it is hoped that the foregoing directions will give the reader some idea "How Wills are Proved."
H E. B.

In my last article, entitled "Gentlemen of the Jury!" it was inadvertently stated that special jurors are now paid £1 1s. per day, and common jurors 10s. 6d. per day. This should be altered as follows :— Special jurors are paid £1 1s. a *cause*, and common jurors 1s. a *cause*.

THE PROFESSION OF ELECTRICAL ENGINEERING.

BY J. MUNRO, C.E., AUTHOR OF "PIONEERS OF ELECTRICITY," ETC.

THERE are now at least four learned professions—the Church, Law, Medicine, and Engineering. The Ministry and Law are concerned with the spiritual and moral, Medicine and Engineering with the material well-being of a man. If the Church deals with his relations to God, and the Law with his relations to his fellow-men, Medicine and Engineering are equally occupied with his relations

—intimate or casual—to Nature. Covering as they do the whole field of human life, they are all connected with each other. Though we have named the Church and Law together as dealing with moral effects, and Medicine with Engineering in respect of physical things, we might, on the other hand, class the Church with Medicine in their joint concern for the health of the individual, and Law with Engineering, since they

relate to his surroundings. All of them require a special training of a thorough kind, and call into play the highest faculties of the mind.

Engineering is, perhaps, the youngest of the four, and electrical engineering is the latest branch of that ; but it is quite as vigorous as any of the others. Depending, as it does, on our knowledge of physical laws and the properties of materials, as well as on the general progress of civilisation, it is extending its dominion even faster than the other professions. Fifty or sixty years ago the mechanical engineer (or maker of engines and machines), the civil engineer (or maker of roads, canals, and railways), with his brother the military engineer, were the leading representatives of the profession. The introduction of the electric telegraph brought the telegraph engineer, who has since developed the telephone engineer ; and within the last ten or fifteen years the use of the electric light and the transmission of motive power by electricity have called forth the electric light and power engineer. The scope of the profession has been greatly enlarged—in fact, there seems no bound to its extension except the limits of the earth.

The best foundation for the successful pursuit of any profession—engineering included—is, of course, a good general education. For an engineer of any sort, it would be well to make it comprise a knowledge of French and German, as well as practice in field exercises, such as swimming, riding, and shooting ; but these accomplishments are not absolutely necessary, and in any case they can be acquired afterwards.

The special education should be determined by the branch of the profession which it is proposed to follow. Electrical engineering may be divided into departments, both founded on the same principles of electrical and magnetic science, but differing in their practice. The first of these is telegraph engineering, with its sub-division of telephone work. The second is electric lighting, and the application of motive power by means of the electric current. We shall consider each of these in turn.

Telegraph engineers are occupied with the making and repairing of telegraph or telephone land-lines, and of submarine cables. There are several classes of them. Consulting engineers or electricians are those who design the cables for the telegraph companies which require them. Manufacturing engineers or contractors supply the overland lines or submarine cables to the orders of the telegraph companies and the designs of their consulting electricians. Lastly, the telegraph companies require electricians to test their lines, and keep their apparatus in good order. The same may be said of the railway companies, the Post Office (which works the national telegraphs), and the telephone companies. Moreover, these last corporations generally construct their own lines, under the superintendence of their own electricians.

The most select opening for a telegraph engineer is through the office of a consulting electrician ; but in this case it is usual for the pupil to pay a premium, and it may be some time before he can earn a salary. His duties, however, are of an instructive kind, and,

being trained by eminent or distinguished men in the profession, he acquires a status, or *prestige*, which is afterwards very serviceable to him. If his masters have a cable on hand, he is initiated into the mysteries of designing it, and is sent to the works of the contractor who is making it to test its properties, and superintend, as a kind of electrical inspector, the progress of the manufacture. He also goes out on the cable ship, and helps in the work of laying and of testing the cable while it is being laid, or for a set time—generally thirty days—after it is laid, and before it is finally accepted by the telegraph company for whom it has been made and submerged. This work is, of course, attractive, involving, as it does, a certain amount of travel—now here, now there—with constant change of scene and glimpses of foreign lands.

Another opening is to be found in the works of the contractors or manufacturing electricians, who equip and send out land telegraph parties to erect lines in distant countries, or make and lay with their own ships the submarine cables which have been ordered by the cable companies. In the testing rooms and factory of these contractors he will learn his business very well, and he will receive a salary which is sufficient to support him. Two pounds a week are sometimes paid even to beginners, if they are intelligent and well educated. They are servants of the contractors, and have therefore less freedom than pupils ; but in any case the work is not very hard, since it consists principally in accurate observation of the instruments and careful calculation of the results obtained. The learner is liable to night duty in rotation, as the manufacture of the cable goes on continuously. When the cable is finished, he may be selected to go with the expedition and help to lay it. In that case his salary will probably be raised ; and as his travelling expenses are all defrayed by his employers, he can save the greater part of it. The same remark applies to engineers sent out to build a land-line somewhere abroad. There is, however, a drawback to this class of telegraph work. The demand for cables and overland lines is not very great, and it may happen that after the completion of some "big job" a number of the testers or ordinary electricians will be discharged, until such time as another large order sets the wheels of the factory spinning merrily once more. Naturally, the best hands will be retained in such a case, so that the better electrician he is, the better his chance of not being paid off when the dearth comes.

The Post Office also employs electricians to test and superintend the making of its lines ; but this is a branch of the Civil Service under its own regulations, and it is perhaps rather difficult to get on the electrical staff. The railway companies have their own electricians, too, and a berth for a skilled person occasionally offers itself in their service. The telephone companies have also their engineers, either recruited from their other employés or by advertisement, or through a good word spoken by a "friend at court."

Science classes in the University are sometimes a good step towards becoming a telegraph engineer. It occasionally happens that a professor of electricity and

magnetism is also a consulting electrician, and can select one of his best students for some appointment in his gift. The student in that case goes direct from the laboratory to his profession, without serving an apprenticeship. Berths as electric light and power electricians are also obtained in this way, but it is not a regular avenue to the work. The School of Telegraphy and Electrical Engineering in Hanover Square may also be mentioned as a training-place for telegraph and other electricians.

While telegraph is allied to some extent with civil and military engineering, electric light and power is closely connected with mechanical engineering. It follows that the best way of becoming an electrical engineer of this class is to learn mechanical engineering, and on that as a basis, add the study of electricity and magnetism. After a young man has served his apprenticeship in the shops as a mechanical engineer, and at the same time acquired a theoretical knowledge of mechanics, steam, and the steam-engine at the classes of some University or technical college, he will be able to pick up enough electrical science in the class-room and the laboratory, or in the factory of an electrical manufacturer, say in about a year, to enable him to take a berth as an electric light and power engineer, either on a steamship lit by electricity or in the service of the electric lighting and supply companies, or the electrical laboratories of the great shipbuilders. The shortness of this training in electrical work is due to the fact that the general principles of electrical and magnetic science are comparatively few and soon mastered, although the effects and particulars are numerous and varied. With the electric light gradually making its way in town and country, with electric railways springing up around us, this is by far the most promising branch of electrical engineering.

In conclusion, it may be well to offer a few remarks on the natural qualifications most suitable for the pursuit of this profession. A boy destined for any kind of

engineering should have all his wits and senses about him. Physically he should be sound in wind and limb, hardy, energetic, and by preference fond of athletics and field sports. In character he should be plucky and resolute, practical and manly. He should not be afraid of work, either with head or hand. He should be a quick and correct observer, a clear and accurate thinker. Inaccuracy is a troublesome fault in an engineer, and a mistake on his part may cost very dear, not only in money, but in suffering and death. At the least, he ought to have no distaste for the profession, and if possible he should have a decided love for it. Best of all, he should reveal a true bias for the work—that is to say, a natural turn for it. The lad of fair intelligence who does not dislike it, or even likes it from the first, may by dint of application and experience become a useful engineer and electrician, but he who has a strong mental bias for it will excel his fellows, and rise to the top of his profession.

A predisposition for a certain walk of life generally implies a love for it, together with the necessary talents. A predisposition for engineering involves mathematical, scientific, and constructive ability. The boy should show an interest in scientific and more especially in mechanical experiments and building operations. He should be fond of study and calculation, and evince an inventive genius. There should be originality in his devices, whether he is working at the lathe, making chemical experiments, or building a rabbit-hutch. Parents should not too hastily conclude that because he is engrossed with bricks and other toys of the kind he is therefore an architect or an engineer in embryo.

In order to find out a boy's real bent, it will be well to place him under a variety of circumstances, so as to call out and test the growing predisposition, which it should be the aim of every educator to discover.

"YOU'RE NEVER READY."

LAST winter, frilled with silvery fur,
I vowed that she was daintiest, neatest;
But ah! what matters dress to her?
She's always sweetest.

Yet no! I'd have her robed in white,
In garden hat and belted jacket;
And certainly her fingers light
Should hold a racquet.

She leaves me here to yawn and stretch,
And pace the walk in turns unsteady;
Then comes, exclaiming, "Lazy wretch!
You're never ready!"

She mocks my play with lip and eye—
Oh, scorn enow she makes me suffer!
Yet well she knows the reason why
I'm such a duffer.

It is not that my skill is small,
But hopeless odds her rival plays at;
For who on earth could watch a ball,
With her to gaze at?

"Game—love," she cries; "go, hide your shame!"
"True words," I answer, sadly witty;
"With me it's love, with you it's game—
And more's the pity!"

FREDERICK LANGBRIDGE.