

# **The Confessions of a Consulting Chemist**

William Faitoute Munn

## Table of Contents

<u>The Confessions of a Consulting Chemist.....</u>	<u>1</u>
<u>William Faitoute Munn.....</u>	<u>1</u>

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One day a clean-cut, pleasant-looking man came into my office, introduced himself, and began cbatting so intelligently upon various scientific subjects that I became interested in him at once. Suddenly he leaned toward me and said:

"Mr. Munn, I want you to find some means of melting metal by cooling it."

My interest increased, but my confidence grew less. There was no doubt that the man was in earnest. He stared at me in a most anxious manner.

I tried to explain to him that as a theory his idea was not without interest, but that, to my deep regret, I had not got thus far in chemistry. Then my curiosity got the better of me.

"I wish you would tell me why you are anxious to melt metal by cooling it," I pleaded.

The man's eyes glowed, and for the first time I noted that he was a trifle peculiar.

"There's millions in it!" he exclaimed.

If I could melt metal by cooling it, there would be no noise, no danger of explosion, no fire, and"—here he paused, to impress me with the special importance of what he was saying—"no interruption by the police. Why, if I had something like that, there wouldn't be a safe in New York I couldn't get into! The biggest and toughest tumblers would melt like wax. It's a great proposition. You're a chemist, and"—here he made a gesture embracing several hundred jars on my shelves—"with some of that stuff I am sure you could mix up just the thing to do it."

As quickly and quietly as possible I ushered him to the door and bade him a pleasant good night. Perhaps I should have had him arrested, or had his sanity tested. At any rate, he went away with a very poor impression of me.

"You must be a pretty punk chemist!" he said, as he went down the steps.

This little incident isn't much of a confession, except that it illustrates my contention that more cranks—or, in present-day vernacular, more "plain and fancy nuts"—visit chemists than any other group of professional men. A consulting chemist runs the gamut of absurdities. He is regarded by some as a magician; by others as a man who has taken up a trivial sort of business, and who charges exorbitant prices just for mixing up two or three powders or liquids.

The people who seek advice or aid from a consulting chemist go to the very extremes in their requests. There was a man in a New Jersey city who had begun the manufacture of a substitute for butter. He came to me in great distress.

"I cannot make this taste like butter," he complained. "I wish you would taste it and tell me what the matter is."

## The Confessions of a Consulting Chemist

"What are the ingredients?" I asked cautiously.

I will take a chance on mixing explosives, but not on what I put in my mouth. The man told me, and I found that he was using practically the same basis as others do for butter substitutes.

From the sample he brought me I made a few tests, and then I tasted it. My visitor was right. There was something lacking. As a substitute for butter his concoction would never sell.

"If you will come back to me in ten days, I think I can tell you what to do to make this all right," I told him.

He left a large sample and went away quite hopeful. He was back again bright and early on the morning of the tenth day.

"Did you succeed?" he asked eagerly.

"Taste it," I said, holding out his own sample.

He did so, and went into ecstasies.

"That's great!" he shouted. "Perfectly wonderful! Is it going to be very expensive for me to fix this?"

I told him I did not think the expense would be very heavy, and he asked me for the formula. Without a chance of countenance I drew forth a slip of paper, wrote one word on it, folded it, and handed it to him. He grasped at that paper as if it were a twenty-carat diamond, opened it, and read the single word.

Then he gasped and looked at me.

"Well, ain't I a dashed fool?" he exclaimed.

The one word I had written on the paper was "salt." My client had concocted a very good substitute for butter, but he had neglected the simplest little ingredient of all.

Now here is where my confession comes in. When first I tasted his sample, I knew that it lacked salt; but it would scarcely have been good business for me to have told him so at that time. He would not have been greatly impressed with the value of a chemist's labors; but under the belief that I had been analyzing and experimenting for ten days, he was ready to thank me warmly and pay me a reasonable fee.

Such simple problems do not fall to the lot of a consulting chemist every day. I have a friend in the textile business, whom I have known for years. One day he dropped into my office for a little chat.

"By the way," he said, "some of our competitors are putting out a fabric that is all the rage with the women because of its peculiar shade of color. I've got a piece of it here. I wish you'd chuck it into one of your glass tubes, or whatever it is you do with such things, and I'll wait a few minutes while you tell me just how that dye is made"; and, leaning back in his chair, he lighted a fresh cigar.

"Are you going to wait?" I asked him.

"Sure," he replied. "I can wait half an hour, if necessary."

"If you wait until I have finished my analysis, you will be here a week at least, but more likely a month, and possibly a year," I told him.

## The Confessions of a Consulting Chemist

My friend thought I must be joking, and it was with difficulty that I could convince him that I was serious. While he knew a great deal about the weaving of fabrics, he knew nothing whatever of dyes. Some cloths will take acid, some a basic dye; then again the conditions under which they are dyed must be taken into consideration, also many other technical details concerning which my friend had no knowledge.

I took the sample of cloth he gave me, and at the end of two weeks had learned what he wanted to know. It seemed to pain him when he paid my bill.

"This is a dead loss!" he grumbled. "The blamed stuff is beginning to go out of style, and by the time we can get some on the market it will be hopelessly old-fashioned."

So much for dealing with an acquaintance. I prefer strangers.

Neither the consulting nor the analytical chemist gains as much credit or glory as one would think when the many really worth-while things they achieve are taken into consideration. Of course, we are paid for our work, but money is not everything, as has been said a great many times before. I have in mind an instance that will illustrate my meaning.

The head of a manufacturing concern which turns out great quantities of a certain sort of tank decided that he could make fire-extinguishers at a good profit.

"You see," he explained to me, "I have the machinery all ready for making the cans; I have the material; in fact, I have everything."

I remained silent, waiting for him to explain his mission.

"Oh, yes," he went on, as if it were an afterthought, "I have everything except the fire-extinguisher stuff to put in the cans!"

"Oh, I see! And you want me to fix up some of the 'stuff' to fill your cans?"

"That's it exactly. Of course, I do not expect you to make it for me. All I want you to do is to mix up something that will really put out a fire, and then tell me how to do it."

I experimented until I had made an extinguisher which suited me. It would really do the work, and I was quite satisfied. My client paid me, and, as payments go, the remuneration was adequate.

More than a year later I was strolling around at one of the many annual expositions in New York when I came to a booth where a fire-extinguisher was being demonstrated. In a small fire-proof compartment all sorts of combustibles were ignited before the spectators, the fire-extinguisher was brought into action, and presto, the blaze was out.

I picked up one of the extinguishers, read the label, and found that the fluid it contained was my own concoction. Of course, there was nothing to complain of in this, but I felt a little aggrieved by what one of the demonstrators was saying. He was talking volubly and convincingly to the spectators.

"For more than four years," he assured them, "our concern had a score of the most skilled scientists and chemists in the country experimenting to perfect this little extinguisher!"

The man talked for fifteen minutes along this line, dwelling upon the manner in which the manufacturer had devoted large sums of money, and the labor of years, to the perfecting of the liquid extinguisher. As a matter of

## The Confessions of a Consulting Chemist

fact, it took me just five days to concoct the "stuff" that he had asked for.

Another manufacturer came to me and said that he wished to put a shoe-polish on the market. His business was shoe findings, and he desired to add the polish.

Almost any one knows that two things are necessary to make a good shoe-polish. One is the presence of something that will give a quick and brilliant polish; the other is the absence, as far as possible, of anything injurious to the leather.

It may seem strange, but I was very much interested in this commission. I experimented from morning until night, for several days, until I began to believe that I never could get the black out of my hands. Finally I got a polish that suited me. There was plenty of wax in it, and this gave a good "shine." I also managed to do without a certain acid which is used in many polishes, and which does no good to the leather.

To-day that shoe-polish is selling all over America, and has been sent abroad in large quantities. You see its name on city billboards and country fences. You see it advertised in street-cars, subways, magazines, and shop-windows.

These two instances illustrate what I meant by saying that neither the consulting nor the analytical chemist gets quite a fair share of credit for his work. There are analytical chemists who, in long years of labor, have perfected hundreds of useful things. Their names would literally be household words if they appeared on every tube of tooth-paste, every cake of soap, every box of shoe-polish, every bottle of ink-eradicator, and the like, that these resourceful and ingenious men have brought into existence.

Sometimes a chemist saves many lives. I shall always believe I once prevented a disastrous accident, not through any brilliant discovery of my own, but simply because I happened to arrive in a nitroglycerin plant just in time.

The manufacturers had sent for me to come down and see them. When I arrived, they explained that for some unknown reason they were not getting the regulation explosive force out of their last two or three lots of the nitro. This is a composition, as most people know, of sulfuric acid, nitric acid, and glycerin. It is dangerous to handle, and must be kept in a low and even temperature.

They gave me some of the substance, but I explained that I would like to go into the mixing-room. I was taken in just as some workmen were about to mix a new lot. I became suspicious at once, and, without as much as "by your leave," I took the testing thermometer from the hand of one of the workmen and tested two of the ingredients which were then in separate retorts.

"Don't mix those!" I commanded peremptorily.

Some of the workmen, knowing that the proper amount of explosive force was not resulting, had attempted some slight variations of their own in the established formula. For some time they had been combining two ingredients at a trifle too high a temperature, and instead of lessening the degree of heat they had begun increasing it.

At the temperature revealed by my test, probably not more than ten minutes before the mixing process, the mixing-house would have been blown to atoms, and the adjoining buildings would probably have gone with it. As for the score of men working in the room, it is doubtful if more than a memory would have been left of them.

There is always the possibility of fortune and fame just ahead of the untiring analytical chemist. It is this possibility which makes the profession so fascinating. We may experiment and experiment, and throw away mess after mess; a hundred times in succession a mere smudge may come out of the crucible; and then, on the hundred and first experiment, there may be a fortune. For instance, it might be a synthetic rubber that could be made to sell

## The Confessions of a Consulting Chemist

as cheap as wood, or it might be an absolutely perfect synthetic tooth-enamel.

There was a young amateur in chemistry named Hyatt, who was extremely fond of dabbling in all sorts of queer messes. One day he combined camphor and gun-cotton, and the result was a soft, white substance which hardened. He thought that if he could mold this into sheets, it might prove of commercial value; so he went to several of the professors of chemistry, and asked if it could be done. They all told him that it could not. They said that a terrific explosion would result.

Theoretically, an explosion should result from this process; but chemistry does not always run according to theory. One noon, when every one else was away, Hyatt took the chance, heated the substance under pressure, and stood by to watch the result. Instead of producing an explosion, he had turned out the first sheet of celluloid!

There are, of course, a great many tricks in trade goods. There have been many exposures of adulteration in foodstuffs and other articles. I have analyzed a delicious wintergreen flavoring extract and found that it was composed of carbolic acid, coal-tar, and some third substance which was not wintergreen. In fact, the first thing that an analytical chemist looks for when analyzing foods, dyes, perfumes, and cosmetics is coal-tar, or coal-tar products.

Only a little while ago a man came to me with a certain article which I cannot mention, as it has lately been put on the market.

"There is only one defect in this," he said, "and that is its terrible smell. No one would buy it just because of that. The odor really doesn't hurt it, but you can't convince the people that anything smelling as this does can be any good."

The man was right. It did smell terribly. From the very nature of the article I could not even hazard a guess as to the cause, but I thought I knew a remedy. I told him to sit down and wait a minute. Then I took his sample into my laboratory and treated it with ozone, which is a very simple and short process.

I had hit it right the first time. When I brought it back and gave it to my client, it had no odor. He sniffed at it, examined it carefully, cut into it with his pocketknife, and exclaimed:

"What have you done? Substituted something else in this tin?"

I assured him that I had not, and told him what a simple matter it would be to do away with the odor. That man paid me well, exceedingly well, considering that I had been to no expense whatever and that he had taken only twenty minutes of my time.

I suppose every chemist has his dream. I will finish my confession by admitting that I have one. My dream is to create a mineral brick which will stand a heat test of four thousand degrees Fahrenheit. If I can produce such a thing, there will be a big and steady market for it. All existing fire-bricks, when put under exceedingly great heat, melt along the edges, which necessitates frequent rebuilding.

Some day I'm going to perfect that brick!

### MY QUEST

Discouraged, weary, and depressed, I sought the rainbow's end; At last I found it—fairy quest! A heart of gold—a friend.

Florence Earle Buck