

# Reflections on the Ethics of Experimentation with Human Subjects with Respect to *Arrowsmith* (1931)

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## Summary

The moral tension between individual rights versus common good in experimentation with human subjects has been constant throughout history. Taking as a basis the film *Arrowsmith* in which this problem is well reflected, an ethical analysis is made, bearing in mind the time when the film was made, some historical antecedents and, finally, establishing a comparison with the current situation.

**Keywords:** Human research, Ethics, Bacteriophages, Plague, Cinematographic Adaptation, Sinclair Lewis.

## Technical details

**Title:** *Arrowsmith*

**Country:** USA

**Year:** 1931

**Director:** John Ford

**Music:** Alfred Newman

**Screenwriter:** Sidney Howard adaptation of the Sinclair Lewis novel *Arrowsmith*.

**Cast:** Ronald Colman, Helen Hayes, Richard Bennett, A.E. Anson, Clarence Brooks, Claude King, Bert Roach, Myrna Loy, Russell Hopton, David Landau, Lumsden Hare and John Qualen.

**Color:** Black and white

**Runtime:** 99 minutes

**Genre:** Drama

**Production Companies:** Howard Productions and Samuel Goldwyn Company.

**Synopsis:** Martin Arrowsmith is a doctor with a clear vocation for research. He therefore leaves his practice as a country doctor and goes to work with his mentor in the McGurk Institute in New York. In the West Indies he tests the effectiveness of an anti-plague serum he has developed; meanwhile his wife dies accidentally. This and the mental deterioration of his mentor lead him to leave the institute and research freely<sup>1</sup>.

**Awards and nominations:** nominated for

four Oscars, best film, adapted script, photography and scenery, in films released in 1931.

In this journal an article has been published previously on *Arrowsmith* (1931) by John Ford, focusing on some of its cinematographic aspects and on its microbiological contents<sup>1</sup>. This study deals with the ethics of experimentation with human beings reflected in the plot.

The first thing to bear in mind is that this is a 1931 film based on a novel published in 1925, *Arrowsmith*; hence we must situate ourselves in the exact moment in time when it was filmed.

At that time there was a certain determinism in the aetiopathogenic interpretation of infectious diseases: a specific germ/a specific disease/a specific treatment or a specific measure for prevention. This had been achieved with the vaccines for smallpox and rabies and with the anti-diphtheria serum and it was a direct consequence of the concepts Contents in Koch's Postulates. The discovery of "healthy carriers" would question such rigorous determinism. The film we are commenting tackles the problem of bubonic plague, one of the four horsemen of the Apocalypses, and in one of its scenes shows the transfer of corpses with a dark background of miasmas. The aim is to emphasise the scourge that the plague represented and

the challenge it was for science to be able to combat it. This is one of the main arguments used to criticise medical research and American society of the age.

*Arrowsmith* is a novel by Sinclair Lewis (figure 1)<sup>2</sup>, Nobel Prize for Literature in 1930, and in order to write it Lewis sought the advice of Paul de Kruif, who, one year later in 1926, published his well-known work *Microbe Hunters*.



Figure 1: Sinclair Lewis

Paul de Kruif is a curious figure. Professor of Bacteriology at the University of Michigan, he later worked at the Rockefeller Institute which appears in the film disguised as the McGurk Institute. In the character of Sondelius, the Swede who collaborates with Arrowsmith in the plague epidemic, we seem to be able to glimpse Paul de Kruif and his eagerness to divulge the findings of Microbiology. His first appearance in the film is at a conference on these findings.

The adaptation of the novel for John Ford's film was done by Sidney Howard and is based on the second part of it: the period when Arrowsmith is working at the research institute in New York and his participation in the plague epidemic, after a brief period as a country doctor.

Both the novel and the film show, on the one hand, the conflict of the altruistic researcher with the mercantilism and exhibitionism of scientific work, with the press communiqués and demand for success at all costs, which is well reflected in the film, in what was American society in the 1920s (figure 2). On the other hand, the ethics of the methodology of experimentation with humans is questioned: the research in which a serum against the plague is going to be tested, but which is only going to be administered to half of the population, leaving the other half without treatment.

There is, thus, an “experimental group” which will receive the serum and a “control group” which will be given nothing and which, today, would be represented by the patients that receive a placebo in a clinical test.

Moral tension is what appears in this type of research, between individual rights and common good, between the theory of the rights of man and the theory of the objectives pursued by science. Should individual rights take priority over common good, or vice versa?

For a Kantian, man is an end in himself and cannot be used just as a medium (*man, and in general every rational being, is an end in himself, not merely as a means to be arbitrarily used by this or that will, but in all his actions, whether they concern himself or other rational beings, must be always regarded at the same time as an end*)<sup>3</sup>. Here the rights of people would prevail above all (figure 3).

However, for a utilitarian what is right is to achieve the greatest good of the greatest number of

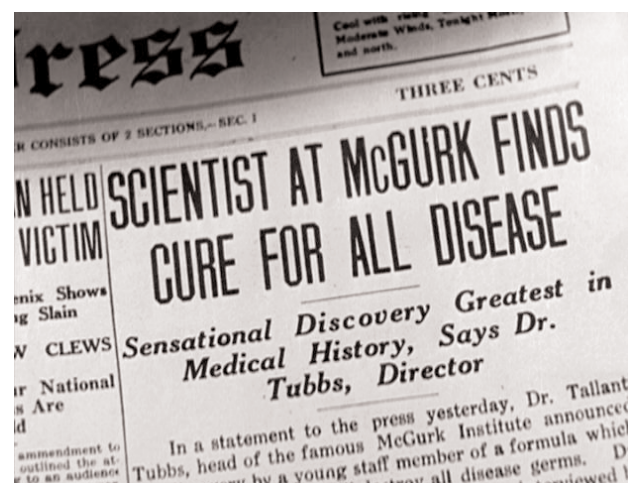


Figure 2: The press publishes Arrowsmith's discovery in a note filtered by the Mac Gurk Institute exaggerating its importance

people, which would justify an individual or a small number of individuals being sacrificed for the good of humanity. Nonetheless, this should be done maximising good and minimising evil, i.e., using the least possible number of subjects in order to achieve the success of the experiment.

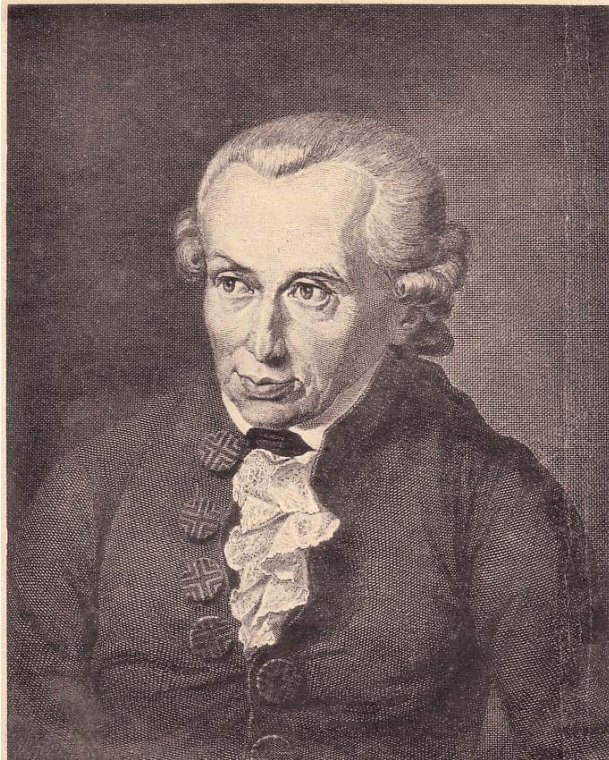


Figure 3: Immanuel Kant

At the time when the film was made, a utilitarian criterion prevailed in scientific research, which already had a clear exponent in the 18<sup>th</sup> century, with the first great discovery made by microbiology – vaccination.

Mention should be made of a paragraph in a letter dated in Berkeley on 1 July 1796, in which Edward Jenner (figure 4) tells his friend Gardner about the discovery:

*A boy of the name of Phipps was inoculated in the arm, from a pustule on the hand of a young woman, who was infected by her master's cows. Having never seen the disease but in its casual way before, that is, when communicated from the cow to the hand of the milker, I was astonished at the close resemblance of the pustules, in some of their stages, to the variolous pustules. But now listen to the most delightful part of my story. The boy has since been inoculated for the small-pox, which, as I ventured to predict, produced no effect. I shall now pursue my experiments with redoubled ardour<sup>4</sup>.*

Jenner did not hesitate to use an eight-year-old boy, whom he first vaccinated and then inoculated smallpox in order to confirm that he was immunised. In this case it is clear that the English researcher firmly believed that it is ethically correct to sacrifice a child for the good of humanity.



Figure 4: Edward Jenner

Here the experiment had a happy ending, to the extent that in 8 May 1980 a resolution of the XXXIII Assembly of the WHO solemnly declared the eradication of smallpox in the world.

But in 1931, when the film takes place, utilitarian ethics in human experimentation was already being questioned. This is precisely what Sinclair Lewis was aiming at with his new novel and John Ford with this film. Both of them are situated within the critical realism of American literature of the age, which has among its representatives William Faulkner, Scott Fitzgerald and Ernest Hemingway, some of whose works were made into films. Let us recall *The Great Gatsby* (1974) by Jack Clayton or *A Farewell to Arms* (1932) by Frank Borzage, and a remake with the same title (*A Farewell to Arms*) by Charles Vidor in 1957.

In the film *Arrowsmith* the tension is revealed between the scientific rationality of the researchers

and the emotiveness of the members of the committee that has to authorise the experiment, who cannot understand why a certain number of people are to be deprived of a potentially effective treatment.

The research begins to be developed according to a previously designed plan, but in the end emotiveness triumphs, deriving from the doctor's feelings on the death of his friend and, above all, of his wife as a result of the plague; hence he ends up applying the serum to the whole population (figure 5).



Figure 5: Serum for all

The researcher knows that he has not performed the experiment correctly, which is reflected in the film and much more explicitly in the novel where Lewis says that whether by the effect of the phage (in the film a “serum” is used, which since it is the consequence of a prior finding at the McGurk Institute (1) could well be a suspension of phages for which the name serum is used so that it will be more within reach of the viewers), of the extermination of the rats, or the intervention of Providence, the case is that the epidemic decreased and six months later had completely disappeared”.

However, New York society receives Arrowsmith as a hero and exploitation of the supposed success in research begins, which is the other aspect that this film seeks to criticise.

Along this same line of criticism of experimentation with human beings, the Irish author, Bernard Shaw, (figure 6) a contemporary of Sinclair Lewis and John Ford, wrote a work entitled *The Doctor's Dilemma* (1906), in which the following dialogue appears:

— Sir Patrick: ...You remember Jane Marsh?

— Ridgeon: Jane Marsh? No.

— Sir Patrick: ...You don't!

— Ridgeon: No

— Sir Patrick: ...You mean to tell me you don't remember the woman with the tuberculosis ulcer on her arm?

— Ridgeon: Oh, your washerwoman's daughter. Was her name Jane Marsh? I forgot.

— Sir Patrick: Perhaps you've forgotten also that you undertook to cure her with Koch's tuberculin.

— Ridgeon: And instead of curing her, it rotted her arm right off. Yes. I remember. Poor Jane! However, she makes a good living out of that arm now by shewing it at medical lectures.

— Sir Patrick: Still, that wasn't quite what you intended, was it?

— Ridgeon: I took my chance of it.

— Sir Patrick: Jane did, you mean.

— Ridgeon: Well, it's always the patient who has to take the chance when an experiment is necessary. And we can find out nothing without experiment.

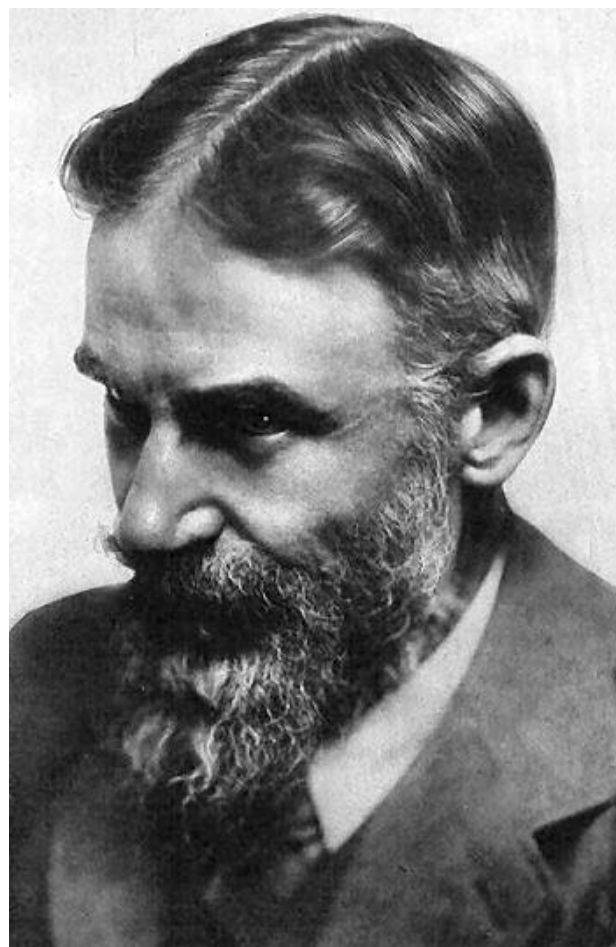


Figure 6: George Bernard Shaw

By making a straightforward criticism of medical research, Shaw brings to light a topic that does not appear in the film: the side effects or undesirable effects produced by the drug being experimented. And this is precisely why it has been affirmed that it is quite often better to receive a placebo or be in the control group<sup>5</sup>.

From the current perspective, there are three criteria that must be fulfilled in the ethics of experimentation with human subjects.

**1.- Correct design of the study.** What is not technically correct is not ethically good. In the film this criterion is not observed, but that is precisely the moral message sought to be transmitted: the triumph of humanitarianism over scientism; that everyone should receive a treatment that may be beneficial, even at the expense of sacrificing the scientific results.

A much more recent similar case is the introduction of zidovudine (AZT) for treating AIDS. When this medicine appeared, the American FDA insisted on a clinical trial versus a placebo, which caused the indignation of AIDS patients. The argument used was similar to the one in the film: the disease is very serious and no one can be deprived of a potentially effective treatment.

Even so, the trial was performed, and when it was verified that the response of one of the groups was greater than that of the other, what has to be done in these cases was done: suspend research and apply the treatment to all the patients. It seems that in this case too there was a certain amount of emotiveness, since research was suspended somewhat prematurely, and then it was found that some of the results collected were due to a "placebo effect".

When, subsequently, other antiretroviral drugs appeared which could be more effective, clinical trials were also carried out, but by then there was a standard treatment, AZT, and hence it was no longer necessary to use a placebo and the control group received the standard treatment<sup>6</sup>.

**2.- Informed consent.** Informing the subject of experimentation about the research and obtaining his/her consent were not contemplated at the time when *Arrowsmith* was filmed.

Hans Jonas<sup>7</sup>, a German Jewish philosopher, highly sensitive to the experiences with the Nazis, says that freedom is, undoubtedly, the first condition that must be observed here. Allowing one's body to be used for medical experiments is totally beyond any demandable social contract. Nevertheless, this author always admits the voluntary participation of patients in clinical trials addressed to treating their own disease.

Although in the film the voluntary nature of the subject's participation is not posed, the object of the research was the prevention of a disease as serious as the plague and which these people were suffering.

An exception to informed consent is made in the case of danger to public health, which justifies, for example, compulsory vaccination. It is evident that the plague is a serious danger to public health, but in the case of the film the matter in question was an experimental treatment and, moreover, with a control group which was not going to receive it; hence, this exception would not be acceptable.

**3.- Clinical Equipoise.** In this case, this is what would justify the existence of a control group. This term has been translated by some as "clinical equilibrium"; Francisco de Abajo and Diego Gracia<sup>7</sup> translate it, more accurately in my opinion, as "clinical uncertainty".

For, what justifies research with human subjects? Well, what justifies this type of experiments is the degree of uncertainty of science.

For the criterion of uncertainty to be fulfilled, the scientific community must consider that for a certain disease there is either no treatment or those that exist are not very effective and frankly improvable, so that it can never be known beforehand who is at an advantage, those in the experimental group or those in the control group.

This aspect of the possible benefits of the serum used against the plague, versus its possible adverse effects, is not reflected in the film although, as we have seen, at that time Bernard Shaw had already included it in the abovementioned work *The Doctor's Dilemma*.

Experimentation with human subjects, which as it appears in the film was already a disturbing issue at that time, became intolerable when the experiments carried

out by the Nazis in concentration camps were known.

Not until after the Second World War did research with human subjects begin to be regulated, first by the scientific community itself, through the Nuremberg Code or the Declaration of Helsinki, and then by the State through legislation. And from that moment the philosophical foundation of human experimentation changed and the argument was totally Kantian. Both in the World Medical Association Declaration of Helsinki and in the Convention on Human Rights and Biomedicine, signed in Oviedo by the Council of Europe in 1997, it is established that in any type of human research the welfare of the individual should have priority over the sole interests of science or society.

The film *Arrowsmith*, together with its historical value, where we find American society portrayed and the situation of medical research in the first half of the 20<sup>th</sup> century, poses two basic questions which are still topical and hard to answer:

Is it ethically correct to use a control group that does not receive the treatment, especially in serious diseases that lack treatment?

To what extent is it licit to divulge, through the media, insufficiently verified scientific discoveries which may arouse false hopes in incurable patients?

To date, neither the legislation, nor the ethical committees, nor the scientific community, nor society itself have been capable of giving a satisfactory answer to these questions.

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Poster: *Australian Daybill* with the two main characters in the film, Dr. Martin Arrowsmith (Ronald Colman) and Leora (Helen Hayes)